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ABSTRACT

In the third comprehensive Utah Statewide Educational Assessment Program, the public elementary and secondary education system is analyzed regarding factors which influence student and school characteristics, classification and demographic measures of the educational process in the schools and classroom, and instructional approaches and techniques for student achievement. The accountability function of the program includes measures of student outcomes in intellectual, emotional, social, aesthetic and productive maturity as goals of educational attainment. The goal results are discussed on the state and school level with descriptions of the measurement instruments, including their development and administration. The basic descriptive and research-oriented results for the entire state are presented with reports to the schools on mathematics and reading achievement tests included in the assessment program. An Enjoyment of School Scale administered to fifth and eleventh grade students is discussed and the educational process measures are described in relationship to key outcome measures. A summary and recommendations review the overall changes since 1978. (CM)

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UTAH

STATEWIDE EDUCATIONAL ASSESSMENT

Annual Report 1981



Utah State
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UTAH STATEWIDE EDUCATIONAL ASSESSMENT

GENERAL REPORT

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January 1982

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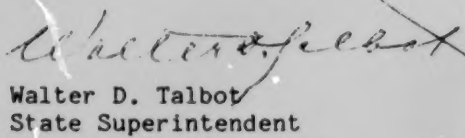
The State Board of Education and its staff are committed to providing quality education for each student within Utah's public school system. Related to this commitment is the need for the monitoring of performance of the public schools in various ways. It is our conviction that assessment of student performance is central to making progressive changes in the educational system. To be most useful, such measurement must go beyond the typical tests of academic achievement in basic skills areas and into such areas as are suggested by the goals which have been set for public education in the state.

This report presents the major results from the Utah Statewide Educational Assessment Program conducted during 1981. This program was Utah's third comprehensive attempt to assess the quality of education statewide using a number of carefully selected measures of important education goals.

The 1981 Statewide Assessment effort involved the testing of students from random samples of both elementary and high schools. Over 4,400 fifth grade students in 67 elementary schools and over 2,000 eleventh grade students in 30 high schools took part in the study.

We believe this General report, along with an Executive summary report, technical documentation, and a brochure which were produced from the study provide a comprehensive examination of student performance across the State of Utah in respect to both important traditional academic areas as well as other important goals of education in Utah.

The entire 1981 Utah Statewide Educational Assessment Program was developed and refined under the direction of the Office of the State Board of Education with assistance from the Institute for Behavioral Research in Creativity.


Walter D. Talbot
State Superintendent
of Public Instruction

ACKNOWLEDGEMENTS

The successful completion of a project of the magnitude of Utah Statewide Educational Assessment would not be possible without the assistance and cooperation of many individuals and organizations.

Within the Office of the State Board of Education, numerous staff members helped shape this program. Several staff members had a very active role in reviewing and creating measurement devices. Special thanks are extended to Curriculum and Instruction staff members including Nancy Livingston, for her review of items in the reading area, and Donald Clark, for his review and contribution to the mathematics materials. Lynn Jensen of Vocational Education provided very valuable suggestions and review of the measurement devices in the Productive Maturity area. Charles Stubbs and Avery Glenn of Curriculum and Instruction provided original item pools in the visual arts and music areas, respectively. Nate Winters of the University of Utah also provided excellent assistance in the visual arts area.

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I. INTRODUCTION



CHAPTER I

INTRODUCTION

Accountability and Assessment

This report presents the results of Utah's third comprehensive statewide educational assessment project. Educational assessment is one important aspect of the concept called "accountability." While the word "accountability" is relatively new to education, the implied process is not. The process of educational accountability includes an assessment of those tasks, objectives, and goals for which individuals and organizations in the educational enterprise are responsible. State assessment programs provide information about student performance in a state educational system.

The Utah Statewide Educational Assessment Program is an analysis of the strengths and weaknesses of public education across the state in certain key areas of educational endeavor. The assessment focuses on the performance of the elementary and secondary educational system across the state as a whole. Thus, this report deals with elements of the accountability of Utah's public educational system.

Olson (1973), in Developing a Large Scale Assessment Program, pointed to some key considerations which underlie today's emphasis on educational accountability:

Americans currently are spending well over \$100 billion for all forms of education, public and private. This means that education has become one of America's biggest industries. As a result, the public wants some evidence concerning the quality of the educational programs.

In a society where education is everybody's business, the adequacy of that system becomes everybody's business. If Americans today were satisfied with their society, if they were united in their perception of social priorities, and if they felt reasonably secure about their power to shape and control the future, there would be less concern today about the concept of accountability. Therefore, it is not surprising that education should come under increasing scrutiny from those on the left, the right, and in the middle, who feel a need to know what the schools are accomplishing, and how their accomplishments can be improved. Citizens, including professional educators, now see assessment as a means to "get a handle" on what has been happening and on what should happen in terms of student performance. (p. i)

At the national level, a significant indication of interest in the assessment area is the National Assessment of Educational Progress. National Assessment was created in 1969 to accomplish two basic goals: 1) to make available the first comprehensive data on the educational attainments of young Americans in 10 learning areas; and 2) to measure any growth or decline that takes place in the educational attainments of young Americans. Over the past several years, National Assessment has entailed a very large scale test construction effort and the testing of thousands of children and young adults across the entire country. Every year this project tests a stratified random sample of nearly 100,000 students. Thus, National Assessment is a major assessment and accountability effort.

A recent study examined the characteristics of state assessment programs across the nation (Kauffman, 1978). This study revealed that state assessment programs now exist in 41 states (up from 30 in 1973). Such programs were put into operation because of legislative mandates in 19 states and existed due to state board directives or other reasons in 22 states. Kauffman reported that the areas most often examined in the state assessment programs were mathematics and reading (37 states),

followed by language (24 states), science (9 states), and social studies (7 states). About half of the programs used some form of sampling as opposed to testing every student at a grade level. Results are reported to the legislature in 33 states, to the state board of education in 34, and to schools or districts in 36 states. The major use of state assessment results across the nation is for curriculum accountability or evaluation, followed by diagnosis and instructional monitoring.

Impara (1978) recently reviewed valid and invalid uses of statewide assessment programs. In his view, statewide assessment "is the means by which the public is made aware of the status of public education" (p. 5). Statewide assessment information validly contributes to funding allocation decisions and instructional planning (administrative practices, staff development, curriculum design, etc.). State assessment programs can also help to raise new questions which can be a valuable contribution to educational theory and practice. According to Impara, invalid uses of state assessment information include school by school and district by district comparisons, allocations of district funds, evaluation of teachers and administrators, making decisions about student performance, and as a basis for establishing statewide curriculum.

A major influence on the accountability movement has been a body of research findings which suggests a lack of efficacy in the entire educational process. Most notably, Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, and York (1966), in what has come to be known as the "Coleman Report," concluded that, in general, the public schools exert very little influence on the achievement of children

independent of their own family background and social context. As reviewed in the next chapter, these and other similar findings have constituted a major challenge to educators to demonstrate empirically the impact of educational procedures.

The Utah Program of Statewide Educational Assessment

Beyond the widespread emphasis on accountability and on programs such as National Assessment and state assessments, what are the antecedents of the Statewide Educational Assessment Program in Utah? Utah educators, citizens, and legislators have traditionally been concerned with improving educational practice. Recognizing this, the State Superintendent of Public Instruction, Walter D. Talbot, provided the major impetus for the first Utah Educational Assessment in 1975. Utah Statewide Educational Assessment is one example of the commitment of teachers and administrators throughout the state, local school districts, and the State Board of Education and its staff to the provision of quality education for each student within Utah's public school system.

The Utah State Legislature has charged the State Board of Education and its staff to accomplish various evaluation activities, including Statewide Assessment. The Legislature expressed its intent in the Appropriations Act of 1977, in which the State Board of Education was directed to mount a continuing assessment program built on the model established in the first Utah Statewide Educational Assessment conducted in 1975. Present long range plans call for a major assessment every three years, with appropriate instrument development and refinement

activities taking place between the major assessment dates.

Beginning in 1974, many groups and levels within the public educational system helped shape the nature of the Utah Statewide Educational Assessment. These included: the State Board of Education, the State Superintendent and his staff, local district superintendents, school administrators, and teachers. A significant contribution was provided by a special Legislative Council Committee on Educational Accountability. Once initial planning for Statewide Assessment was completed, the Office of the State Board of Education contracted with the Institute for Behavioral Research in Creativity (IBRIC) to accomplish many of the operational aspects of the assessment studies, including the current study. IBRIC has had extensive experience in large scale data collection, test construction, and a variety of educational evaluation and research studies.

A most important decision in any evaluation or assessment effort is the determination of what will be assessed. In 1959, a formal statement of educational philosophy and objectives for Utah was published in Curriculum Framework for Utah Schools (Utah State Board of Education). This was followed by the work of an eight-state project called "Designing Education for the Future" (DEF) in which students, parents, professional educators, and a variety of citizens in eight western states, including Utah, identified the major directions education should take. These goals were subsequently further refined by the staff of the Utah State Board of Education and approved by the State Course of Study Committee. The goals were published in the document, Goals and General Objectives of Education in Utah (Utah State Board of Education, 1973).

A list of the goals follows.

Intellectual Maturity--One's intellectual maturity is exemplified by a continuing desire for understanding, a continuing interest in current problems, a continuing accumulation of knowledge, and an increasing ability to use one's rational powers.

Ethical, Moral, Spiritual Maturity--One's ethical, moral, spiritual maturity is exemplified by one's use of rational powers and of internalizing, valuing, and empathizing processes in satisfying oneself regarding life's purposes; in locating oneself in time and space; in revering life; in comprehending death; and in perceiving one's relationships to humanity and to the basic forces of the universe.

Emotional Maturity--One's emotional maturity is exemplified by an increasing constructive management of one's emotions, of coping with stress and frustration, of accepting oneself, and of empathizing with others.

Social Maturity--A person's social maturity is exemplified by increasingly exercising freedom with its accruing responsibilities; demonstrating functional leadership and appropriate followership; interacting in the social environment for self-realization and/or an awareness of the needs and values of others; acting within the basic values, institutions, and processes of American democracy; understanding world interdependence and how diverse cultures function.

Physical Maturity--A person's physical maturity is exemplified by a continuing appreciation and respect for the mind and body; increasing neuromuscular development; fulfilling experiences through physical activity; and continuing positive response toward the solution of problems arising from increased leisure and health needs.

Environmental Maturity--One's environmental maturity is exemplified by a constant seeking to understand one's natural environment through rational thinking processes; through demonstrating fundamental skills required in the use of materials, equipment, and information gathered concerning the environment; through exhibiting an awareness of relationships that exist between humanity and the environment; and through performing acts in the environment that are relevant to one's own well being and to that of others.

Aesthetic Maturity--One's aesthetic maturity is exemplified by an increasing sensitivity in perceiving the environment and acknowledging the human qualities of each individual; by a more satisfying use of one's senses in making aesthetic

judgment; by more capably communicating aesthetic insights through the cultural arts; and through a greater harmony with oneself.

Productive Maturity--A person's productive maturity is exemplified by a continuing involvement in the creating, generating, and using of ideas, goods, and services beneficial to humanity and satisfying to the individual.

Aspects of five of the above stated goals were measured in the 1975, 1978, and 1981 Utah Statewide Educational Assessments: Intellectual Maturity, Emotional Maturity, Social Maturity, Aesthetic Maturity, and Productive Maturity. Goals such as these provide a general definition of educational attainment. Such goals should underlie the formulation of more specific and instructionally-oriented objectives in the schools of the state. The responsibility for helping students achieve broad goals such as these does not lie only with the schools. In many respects, such goals are societal, and therefore a concern of all our institutions, including the home, the schools, the churches, and the community at large.

In addition to measuring student outcomes, Statewide Educational Assessment obtained a variety of information on factors which influenced the attainment of student outcomes. Some demographic measures consisted of factors such as certain student and school characteristics, including geographical designations, socioeconomic status, and a variety of other specific descriptors. Further, information was obtained relating to measurement of the educational process--that is, assessing factors which describe certain key activities within the classroom and factors which describe the school in general. Examples are classroom emphasis on individualizing instruction, student classroom participation, and class size.

Thus, three quite different types of information were collected for the Utah Statewide Educational Assessments. The first deals with student outcomes, that is, what students are achieving and to what degree they are achieving it. The second deals with certain characteristics of students and schools which might influence achievement. These are called demographic or classification measures. The final type of measurement is concerned with identifying certain key aspects of the educational process--i.e., the techniques and strategies by which students learn. The purposes behind the collection of information in these three general categories were to provide: 1) an accurate picture of achievement of students in Utah's public schools; 2) an indication of how certain critical demographic factors influence the way students achieve; and 3) some insight into instructional approaches and techniques which result in high achievement of students. No one study could accomplish any of these three purposes exhaustively. The present study, however, provides some very sound indicators of each of these three areas.

Reporting of Results

In any evaluation or assessment enterprise, the group or groups to which the information collected will be relevant should be identified at the outset. For the present study, the information collected is most germane to decision makers at the state level and the general public of the state. Included in the former category would be: state legislators, the State Board of Education, and the Chief State School Officer and his staff. Assessment results also have relevance for local

school districts, school level administrators, teachers, and students. Specifically directed at these latter groups were three reports including individual student test results on the mathematics and reading achievement sections of the standardized test employed in the study.

Since different groups of professional educators and the public do have different needs relating to the information produced from this study, several types of reports were planned to meet the needs of specific audiences. This permitted the data to be effectively and economically used at different levels in the educational system rather than just at the state level. Thus, several types of reports have been produced from the Utah Statewide Educational Assessment.

Reports Provided to Each School in the Sample

- (1) Reports of the performance of their own individual students on the mathematics and reading achievement tests administered as part of the study.
- (2) Analysis of mathematics and reading achievement test results based on the average scores of all students taking tests in a particular school.
- (3) School level reports on measures directed at the largely non-cognitive Utah goals including: Social Maturity, Emotional Maturity, Aesthetic Maturity, Productive Maturity, and selected educational process scales.

Reports Which Present the Combined Results for the Entire State

- (1) The present General Report directed at general educational audiences, featuring the basic descriptive and research-oriented results.
- (2) The Executive Summary Report which summarizes the most important aspects of the entire study for people such as Board of Education Members, legislators, and others with significant interest, but limited time.

- (3) A concise brochure which briefly highlights key aspects of the study for the general public.
- (4) Technical documentation presenting in-depth methodology and statistical results.

These various approaches to reporting results should deliver the most meaningful level of information to each target group.

Key Characteristics of the Utah Statewide Educational Assessment Program

Utah's Statewide Educational Assessment Program provides:

- (1) Statewide information on how Utah students perform in specific basic achievement areas.
- (2) Statewide information on the standing of Utah students on other largely non-cognitive goals of education including: Emotional Maturity, Social Maturity, Aesthetic Maturity, and Productive Maturity.
- (3) An examination of the relationships between important demographic and educational process variables and specific educational outcomes.
- (4) Information for the schools sampled in the Statewide Assessment project which will aid the teachers and administrators in those schools in making instructional decisions.

The design of Statewide Educational Assessment does not:

- (1) Allow for the comparison of individual school districts.
- (2) Provide a teacher evaluation system.
- (3) Allow the direct evaluation of special programs.
- (4) Measure everything of importance relative to the educational system.
- (5) Provide information about the causes of educational achievement.

These are beyond the scope and purposes of Statewide Assessment.

CHAPTER II

RELATED STUDIES

The abundant information concerned with educational assessment and related research precludes a comprehensive review of the literature in this report. Such reviews are available elsewhere (Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, & York, 1966; Educational Testing Service, 1973; Glass, 1976; Guttentag & Gaar, 1977; and Bloom, 1980). Throughout the Utah Statewide Assessment Program, however, literature has been accumulated dealing with various key issues. Presented here are brief summaries of: 1) studies examining educational quality indicators in Utah; 2) findings from previous studies in the Statewide Educational Assessment Program; 3) factors influencing student educational outcomes; 4) national trends in student achievement scores; 5) public opinions about the educational system; 6) trends in minimum competency testing; and 7) issues in educational assessment methodology.

Educational Quality Indicators in Utah

The Utah State Board of Education has been publishing a series of reports on educational quality indicators, entitled How Good Are Utah Public Schools? These reports (published in 1967, 1971, 1974, and 1979) have brought together valuable information from various sources, usually including the Armed Forces Qualification Test, the Advanced Placement (AP) Program, the American College Testing (ACT) Program, and unique sources of information available at the time of publication of each

individual report. These results provide a valuable supplement to Utah Statewide Assessment results as special samples are compared across time and with national trends; however, excluding Statewide Assessment, they do not provide information about scientifically selected samples of Utah students.

The most recent study, conducted in 1979, provided longitudinal information about academic achievement in Utah, based on the ACT Program, the AP Program, etc. Longitudinal findings from the 1979 ACT Program showed that Utah college-bound students were no longer scoring generally above the national averages, as they had been in the late 1960's and early 1970's. For example, in Mathematics both the Utah and national averages reached a peak in 1970 and then declined from that point. The Utah Mathematics average was generally below the national Mathematics average over the ten year period leading up to 1979. The Utah English average was above the national average until 1975 and was essentially the same as the national average after that point. The Utah average for Natural Science was consistently above the national average, whereas the Utah average for Social Studies was generally about the same as the national average. The Utah ACT composite average showed the same pattern as the national composite average: a decline in scores from 1970 to 1976, followed by a slight upswing. However, the Utah composite average, which was generally above the national average until 1976, was roughly the same as the national average in the most recent years reported.

Advanced Placement (AP) Program findings showed Utah students generally scoring lower than national AP averages in the period from

1966 through 1978. AP areas examined included American history, biology, chemistry, English, and mathematics. However, the most remarkable aspect of the AP Program was the very high participation rate of students in Utah high schools. The Utah participation rate in the AP Program for this period was nearly twice as high as the second ranked state and, in absolute numbers, compared favorably with states having ten times Utah's population. This indicated that a very high percentage of Utah students had access to programs for the academically gifted and that substantial numbers of Utah students were taking advantage of such programs.

Longitudinal findings from the Armed Forces Qualifications Test were somewhat discouraging, at first glance. Utah's ranking on the test had dropped from 6th to 17th between the 1967 report and the 1979 report. While the absolute percentage of "draftees" qualifying in Utah had increased, it had also increased substantially across the entire nation. Actually, the percentage of "draftees" qualifying was approaching 100% in many states, including Utah, so a decline in Utah's ranking should not be given too much weight.

The 1979 report also summarized the results from a special 1977 study examining the levels of "functional competence" of Utah adults. The instrument used in the study was the Adult Performance Level (APL) Survey developed by the ACT Program, which measures five skills (identification of facts and terms, reading, writing, computation, and problem-solving) in each of five content areas (community resources, occupational knowledge, consumer economics, health, and government and law). The results indicated that a great majority of the Utah adult

population could deal effectively with the tasks necessary to function at a minimal level in society.

In 1975, a special study was conducted in Utah to evaluate reading mastery and reading processes (Utah State Board of Education, 1976). A representative sample of students in grades six, nine, and eleven was tested to obtain answers to questions related to statewide objectives in word attack skills, comprehension skills, study skills, and affective reading components. The findings indicated that students at all grade levels were learning phonic skills, but that dictionary skills and multisyllabic word identification skills were lacking. The data suggested a lack of mastery in the area of reading comprehension and reading skills in general, although greater mastery was shown in literal rather than interpretive analytical reading skills. Other results revealed a lack of knowledge about a book's organization and use, reference skills, and the use of a dictionary. Recommendations based on the findings of the 1975 study centered on three areas: 1) upgrading classroom instruction, including the organization of a total reading program leading to greater mastery in word analysis, comprehension, and study skills; 2) the need for teachers to create a positive reading environment in the classroom by showing concern for students and providing enjoyable reading activities for students; and 3) assessing present courses offered in colleges of education to determine their effectiveness in preparing teachers to provide an instructional program which fosters student mastery of reading skills.

The Utah Statewide Assessment Program was designed to build on the recommendations of these earlier reports and to go beyond them in

providing a comprehensive basis for improving education within the state. In the 1967 report, recommendations were made that are especially relevant in directing the Assessment Program to look at areas that are of importance, but which have not been traditionally investigated--such as, Social Maturity, Productive Maturity, and Emotional Maturity. So, while the Statewide Assessment can be seen as a continuation of these earlier efforts, the current study has investigated and integrated many other areas of concern.

Previous Utah Statewide Assessments

The present report will feature specific comparisons of the 1975, 1978, and 1981 Utah Statewide Assessment findings. The following section is a brief summary of the 1975 and 1978 assessments.

The results from the extensive measurement accomplished on five of Utah's goals in the 1975 Utah Statewide Educational Assessment showed areas which were very strong and areas which could benefit by increased emphasis in the public schools. On the Intellectual Maturity Goal, the Utah 5th grade and 11th grade students tested performed effectively in both mathematics and science, clearly exceeding the national averages. The Emotional Maturity measures showed the Utah samples to have generally satisfactory levels of positive adjustment on scales assessing Academic Self-Concept, Self-Acceptance, Social Adequacy, Autonomy, etc. Measures obtained in the Productive Maturity area showed opportunities for improvement along several dimensions related to career education. Increased emphasis also seemed warranted in art and music achievement in the Aesthetic Maturity area, at both grades 5 and 11. In the Social

Maturity area, the Utah students tested generally reported considerable competence in dealing with peer relationship situations.

The 1975 study identified five educational process measures which demonstrated consistent moderate-to-high relationships with various student outcome measures. These educational process measures were Individualization of Instruction, Reinforcement of Self-Concept, Classroom Participation, Development of Career Talents, and Expectations. It was recommended that these and related instructional strategies should be further researched and that they deserved increased emphasis in the public schools.

The impact of socioeconomic status on the achievement and attitudes of Utah students was an important finding and one which agreed with other studies across the nation. The findings suggested that steps should continue to be taken to deal with the educational disadvantages which accrue to students from lower socioeconomic backgrounds.

The 1978 Statewide Assessment used essentially the same measures as in 1975, although Science was replaced by Reading in the Intellectual Maturity Goal area. The carry-over in most of the measures enabled direct comparison between the 1975 and 1978 results.

At the 5th grade level, there were increases in 18 of the 23 measures which were used in both 1975 and 1978. Increases in approximately 78% of the measures used in five of the Utah goal areas indicated a broad pattern of progress by Utah elementary schools. On the achievement tests, the Utah 5th grade students performed effectively in both mathematics and reading, exceeding the national standardization sample. Increases from 1975 to 1978 were most marked in Autonomy, Music

Achievement, and Expectations. Areas where slight declines for 5th grade students occurred included Individualization of Instruction and Enjoyment of School.

At the 11th grade level, the results were less positive. Of 22 common measures used in 1975 and 1978, 11 increased at least slightly, and 11 decreased at least slightly. For the achievement tests, the 11th grade students tested in 1978 had lower mathematics scores in relation to 1975, declining to a level approximating the national average. The reading results showed that the Utah 11th grade students were clearly above the national average in reading skills. The three areas with the greatest improvement from 1975 to 1978 were Self-Acceptance, Autonomy, and Peer Relations. The areas where the most marked declines occurred were Extracurricular Activities, Independent Development, and Educational Orientation.

These findings reflect the general tone of previous studies: Utah students have traditionally performed with some effectiveness where effectiveness has been defined by comparisons with national averages.

Factors Influencing Student Educational Outcomes

A considerable body of knowledge has been developed concerning how student educational outcomes are influenced by student background characteristics, teacher characteristics, and school characteristics. Research findings in this area have strong implications about whether and how schools can educate their students more effectively. An overview of these findings--some of them controversial--is presented here.

The passage of the Civil Rights Act of 1964 required the U.S. Commissioner of Education to conduct a survey and make a report to the President and the Congress, within two years, concerning the lack of availability of equal opportunities for individuals for reasons of race, color, religion, or national origin at all levels of public educational institutions. The U.S. Office of Education responded with one of the most comprehensive and innovative studies ever attempted in the field of educational assessment, gathering information on some 650,000 students and their teachers, principals, and superintendents, in approximately 4,000 public schools throughout the country.

The first publication resulting from the project, Equality of Educational Opportunity (Coleman et al., 1966) examined a wide variety of school, family, and student factors as they contributed to student achievement.

In summary, the authors of the Coleman Report concluded: That the schools bring little influence to bear on a child's achievement that is independent of his background and general social context; and that this very lack of an independent effect means that the inequalities imposed on children by their home, neighborhood, and peer environment are carried along to become the inequalities with which they confront adult life at the end of school. For equality of educational opportunity through the schools must imply a strong effect of schools that is independent of the child's immediate social environment and that strong independent effect is not present in American schools. (Mayeske, Okada, Cohen, Beaton, & Wisler, 1973, p. 2)

These conclusions caused considerable controversy and generated a great deal of concern on the part of educators and the public which is still being felt today.

Following this first report, a special group was formed in the National Center for Educational Statistics to continue the analysis of

the same data base. These efforts culminated in a second report, A Study of Our Nation's Schools (Mayeske, Wisler, Beaton, Weinfeld, Cohen, Okada, Proshek, & Tabler, 1970), which examined how a school's characteristics influence such things as the achievement level of students. The results showed that:

- (1) Very little of the influence of a student's social background can be separated from the influence of the school.
- (2) Until the 12th grade, the influence of a student's social background is usually larger than the influence of the school.
- (3) The common influence of a school's characteristics and the student's social background on attitudinal and motivational outcomes differs at different grade levels.
- (4) Schools that perform well on one achievement measure tend to perform well on other achievement measures also.
- (5) The school variables most heavily related to school outcomes are those concerned with characteristics of the school's personnel, as distinguished from the school's physical facilities, pupil programs and policies, and even personnel expenditures, including teachers' salaries.
- (6) Chief among these characteristics of school personnel are the ones that reflect experience in socially imbalanced educational settings.

In 1973, a third report from the landmark U.S. Office of Education survey of educational opportunity entitled A Study of the Achievement of Our Nation's Students was released (Mayeske et al., 1973). The purpose of this study was to determine which aspects of a student's background, either alone or in combination with the kind of school attended, played the largest role in achievement. The student's family structure was one major variable of interest. The major finding in this analysis was that virtually all the differences in achievement associated with

racial-ethnic group membership could be accounted for by factors that were primarily social in nature and origin.

By far the greatest role was found to be closely played by a set of motivational factors that were closely related to family and child-rearing practices. Among these the most important were: the expectations that both the student and his parents had for his school performance; the extent to which they engaged in various activities that were supportive of these expectations; and the student's outlook on life as to the importance of hard work for success and how an education might benefit him. (p. xv)

At the end of 1973, the fourth of the U.S. Office of Education reports entitled A Study of Attitude toward Life of Our Nation's Students was released (Mayesko, Okada, & Beaton, 1973). This study was designed to investigate various attitude variables and their effect on achievement in the nation's schools, especially: 1) how much of the development of the student's "attitude toward life" was determined by different aspects of his/her achievement and family background, and 2) how the part played by these factors compared with that played by different aspects of the school he/she attended. An index to determine a student's "attitude toward life" was constructed to separate those who believe that hard work leads to success from those who feel luck has a large effect, and to measure a student's belief that people like her/himself have a chance to get ahead. The results concluded that the pessimistic outlook on life held by large numbers of minority group students was an accurate reflection of their social reality and would not be changed until discrimination in employment, housing, and schooling was eliminated. Overall, the student body's "attitude toward life" was far more important than any other school characteristic, and that family background, achievement, and school characteristics played a

greater role in "attitude toward life" for the minority group students than for the non-minority students.

In 1971, the President's Commission on School Finance contracted with Rand Corporation to perform a critical review of current research findings in education (Averch, Carroll, Donaldson, Kiesling, & Pincus, 1972). The survey concluded that the state of the research that had been done could best be described by the following five propositions:

Proposition 1: Research has not identified a variant of the existing system that is consistently related to student educational outcomes.

Proposition 2: Research suggests that the larger the school system, the less likely it is to display innovation, responsiveness, and adaptation; and the more likely it is to depend upon exogenous shocks to the system.

Proposition 3: Research tentatively suggests that improvement in student outcomes, cognitive and non-cognitive, may require sweeping changes in the organization, structure, and conduct of educational experience.

Proposition 4: Increasing expenditures on traditional educational practices is not likely to improve educational outcomes substantially.

Proposition 5: There seems to be opportunities for significant re-directions, and in some cases, reductions in educational expenditures without deterioration in educational outcomes. (pp. x-xiii)

Despite the huge volume of educational research, many major gaps exist, a problem which is still with us today.

In 1974, the Educational Commission of the States released a report entitled Associations between Educational Outcome and Background Variables (Bryant, Glaser, Hansen, & Kirsch, 1974), which examined some of the literature showing associations between background factors and educational outcomes. The investigation of these studies demonstrated that one can expect to account for between 20 and 50 percent of the

variation in educational outcomes (as measured by test scores) by variation in sex, race, home and family background, and school characteristics, as well as student desires, expectations, attitudes, and motivations. There would be substantial variation within this range depending on the nature of the outcome measure, age group of students, and specific background factors being considered. Below are the factors investigated and the conclusions that were drawn from the several hundred studies reviewed by Bryant et al.

Socioeconomic status: From the studies reviewed, the effect of socioeconomic status (SES) cannot be over emphasized. Almost all the major studies reviewed contained some kind of SES measure and concluded that SES alone would account for between 10 and 25 percent of the variance in academic scores. Education of parents, occupation of parents, and items in the home were found to be the most commonly used measures of SES.

Sex: The relationship between sex and achievement scores is based on the age group considered and the particular educational outcomes being studied.

Race: Although race is highly correlated with socioeconomic status, the major articles reviewed have shown that there is an additional component of race that helps explain total achievement variance above that explained by SES measures alone.

Ability: Although in the past, ability has been considered a major predictor of achievement, the studies here have shown that most of the variation in ability measures is accounted for by SES and other background factors.

School factors: In the past, many studies have shown that differences in schools are very important in explaining variations in educational outcomes. However, because of the high correlation between school and pupil characteristics, most of the differences may be attributed to student background characteristics. The point is that, since both factors are so interrelated, they should be considered together when explaining the variance in student outcomes.

Motivation, attitude, expectation, and other measures: Several of these intermediate variables (i.e., intermediate between the fixed background of a pupil and his/her educational achievement) have been shown to affect educational

outcomes. To interpret these measures as background variables is difficult because they themselves are at least partially an outcome of the educational process and at least partially related to SES measures. If these factors are to be used, information such as family relations, self-concept ambitions, job attitudes, and plans for further education are important variables.

In contrast to evidence from earlier studies, there is evidence now accumulating that differences between schools, above and beyond differences in students' SES, race, ability, sex, etc., do account for an important portion of the differences in students' achievement scores. Ironically, the most recent report demonstrating that schools do make a difference comes from James Coleman--the same James Coleman who concluded in 1966 that differences between schools bring little influence to bear on student achievement that is independent of the student's background and general social context. In Public and Private Schools, Coleman, Hoffer, and Kilgore (1981) concluded that private schools produce better cognitive outcomes than do public schools, even after family background factors are controlled. More importantly, Coleman et al. examined how private schools produce better achievement and concluded that:

There are at least two important ways in which private schools produce higher achievement outcomes than public schools. First, given the same type of student (i.e., with background standardized), private schools create higher rates of engagement in academic activities. School attendance is better, students do more homework, and students generally take more rigorous subjects (i.e., more advanced mathematics). The first two of these factors provide modestly greater achievement in private schools. The third, taking advanced mathematics courses, brings substantially greater achievement. The indication is that more extensive academic demands are made in private schools, leading to more advanced courses and thus to greater achievement. This is a somewhat obvious conclusion, and the statistical evidence supports it. Second, student behavior in a school has strong and consistent effects on student achievement. Apart from mathematical coursework

for seniors, the greatest differences in achievement between private and public schools are accounted for by school-level behavior variables (i.e., the incidence of fights, students threatening teachers, etc.). The disciplinary climate of a school, that is, the effectiveness and fairness of discipline and teacher interest, affect achievement at least in part through their effect on these school-level behavior variables. (p. 223)

In short, Coleman et al. found that student achievement is positively influenced by higher academic standards and expectations, and is negatively influenced by fellow-student (mis)behaviors. Coleman et al. also pointed out the possibility of achievement being influenced by other school-level process variables not measured in their study. The findings of this research are controversial as some educators and researchers have taken issue with some of the methodology and conclusions concerning the relative effectiveness of public and private schools (Ravitch, 1981; and Kirst, 1981).

The findings by Coleman et al. (1981), about which school processes seem to lead to greater achievement, were actually not all that new, and have been substantiated elsewhere. A British study of some schools in London (Rutter, Maughan, Mortimore, Ouston, & Smith, 1980) concluded that,

although students differed in the proportion of behaviorally difficult or low achieving children they admitted, these differences did not wholly account for the variations between schools in their pupils' later behaviour and attainment. Even when comparisons between schools were restricted to children who were quite similar in family background and personal characteristics prior to secondary transfer, marked school variations remained. (pp. 177-178)

For example, Rutter et al. found that academic achievement was positively related to the amount of homework, teachers' expectations of student success, the amount of students' work displayed on walls, the

proportion of students using the school library, the proportion of lessons starting on time and not finishing early, and the proportion of students who had held a position of responsibility (such as homework monitor) in their class. Like Coleman et al., Rutter et al. pointed out that an attentive well-behaved class provides the opportunity for effective teaching and productive learning, and suggested that "children's behaviour is most likely to be good in schools when there is an agreed disciplinary approach, but not too much actual use of punishment" (p. 122). For example, they found that achievement was related not to the amount of punishment, but to classroom discipline standards that were based on general expectations set by the school (rather than left to the individual teacher).

Rutter et al. also made some interesting findings about the way in which teachers manage the classroom. Apparently, teachers in the more successful schools spent higher proportions of their time interacting with the whole class rather than with individual pupils. Higher proportions of time spent with the whole class were associated with better attendance, behaviour, and achievement. Rutter et al. elaborated on this point:

Relatively inexperienced teachers in all schools seemed to have difficulty in maintaining contact with the class as a group, and were particularly likely to concentrate on individuals, either to give specific instructions on work, or to deal with disruptive behaviour. The effect of this focus on the individual was often to lose the interest and attention of other members of the class, with adverse consequences in terms of the children's behaviour. . . . It should be appreciated that these findings do not mean that an individualised approach to teaching is a bad thing. Certainly, the very few lessons set up for individualised instruction and being taken by experienced teachers worked well, but the sample is far too small for any conclusions to be drawn. What the results do show, however, is that if the

class is set up for group teaching, it is important to teach in a way which keeps the whole group involved. (p. 117)

One of the recent trends in research into factors affecting student educational outcomes has been to focus on areas of education which, unlike student background characteristics (such as socioeconomic status), are subject to change. Bloom (1980) termed these areas "alterable variables." He concluded that major developments in research into educational outcomes have resulted (and should result) in a movement away from the study of status characteristics of teachers and students toward the study of teaching and learning processes as they take place in the classroom. He identified five categories of alterable variables:

- (1) "Available time" vs. "time-on-task". The available time is set by institutions (for example, 180 school days/year, 5 hours/week on mathematics, etc.). Time-on-task represents the student time actually spent on the task (such as studying mathematics), and is highly related to subsequent measures of achievement and subsequent indices of interests or attitudes toward the learning. The amount of time-on-task depends on the quality of instruction and the student's ability to comprehend what is being taught and what he/she is supposed to do. Time-on-task can be altered by the instructional process.
- (2) "Intelligence" vs. "cognitive entry characteristics". Intelligence represents the student's presumed general ability to learn. Measures of intelligence typically correlate in the .50 to .70 range with academic achievement. Cognitive entry characteristics represent the specific knowledges, abilities, and skills which are prerequisites for the task; they have been shown to correlate about .70 or more with achievement. Cognitive entry characteristics are alterable, since entry skills can be learned if absent or reviewed if forgotten.
- (3) "Summative testing" vs. "formative testing". Summative testing represents the judging and grading of learning outcomes in students. Formative testing represents feedback to the student about learning progress and specific areas of deficiency that need remediation. The

use of test information for corrective purposes (i.e., formative testing) is certainly alterable in the classroom.

- (4) "Parent status" vs. "home environment processes". Parent socioeconomic status has correlated in the range .30 to .50 with student achievement. Home environment process measures involve encouragement for the student to learn well, aspirations of parents for children, provision of help when it is most needed, contribution to the development of the mother tongue, and the ways time and space are organized; this set of processes has correlated in the range .70 to .80 with student achievement. The home environment processes are alterable through courses for parents, parent involvement in schools, games, audio-visual or written materials, home visitors, etc.
- (5) "Teacher" vs. "teaching". Teacher characteristics, such as age, training, personality, performance on achievement tests, etc., have had correlations in the range of about .20 with student learning. But teaching, on the other hand, involves cues, reinforcement, and student participation. The teaching process is alterable, particularly when teachers receive feedback.

The latter category addressed by Bloom--changes in teacher acts and teaching methods--can involve a wide variety of variables as defined by various investigators. This category can include setting the general atmosphere and character of the learning environment as well as specific kinds of teaching processes.

National Trends in Student Achievement Scores

One of the most controversial and complex issues in public education deals with declines in student test scores. During the decade and a half between the early 1960s and the mid 1970s, achievement test scores showed a slight but significant decline at the upper elementary grades and more marked declines at higher grade levels (Harnischfeger & Wiley, 1976). These declines have drawn a great deal of attention from

test publishers, who question the extent to which scaling procedures or the content of the tests may have contributed to the decline, and from the public, who are interested in the implications suggested by the declining test scores regarding the quality of education in this country. These concerns precipitated considerable research attempting to reveal possible factors contributing to the phenomenon. Although trends have emerged revealing some differences between subgroups of the overall test-taking population (which are distinguished by sex, race, socioeconomic status, and grade level), the general drift was unmistakably downward. Research experts agree that there has been no simple explanation, but rather a complex, changing pattern of factors which must account for the decline of test scores over that period of time.

In a 1977 report of the College Entrance Examination Board (CEEB), sponsors of the Scholastic Aptitude Test (SAT), researchers concluded that the SAT had maintained its high reliability as an "unchanging standard" through the years. In other words, the cause of SAT test score decline could not be attributed to the test having become more difficult. This was the same conclusion reached by Harnischfeger and Wiley (1976), who reviewed several widely used achievement and aptitude measures (SAT, ACT, PSBT, CTBS, etc.) and concluded that by and large the tests themselves did not explain the decline of test results.

The CEEB report identified two stages of decline. One, between 1963 and 1970, was characterized by change in the composition of the test-taking population. During those years, the federal government was engaged in efforts to reduce dropout rates in high school and equalize

educational opportunity by encouraging and aiding a greater percentage of high school students to attend college. The lower dropout rate means that more dropout-prone, typically low achieving students graduate from high school and take the SAT. A 1976 ACT research report (Maxey, Wimpey, Ferguson, & Hanson, 1976) cited this also as a highly possible cause of the decline of ACT scores during the last half of the 1960s. The report described it as an increased proportion of lower achieving students taking the ACT.

The second stage of decline identified by CEEB, from 1970 to 1976, was characterized by a set of six national developments: proliferation of high school elective courses; decreasing seriousness of purpose in the learning process as reflected in automatic grade-to-grade advancement, grade inflation, tolerance of increased absenteeism, reduction of homework, and lowering of college entrance standards; increase of television viewing; changing structure of the family; social turbulence of the 1960s and 1970s; and diminution of learning motivation. The Harnischfeger and Wiley report generally corroborated this assessment but placed somewhat more emphasis on the role of the educational system in affecting the decline of achievement test scores.

However, since 1976, the decline in test scores appears to have slowed markedly, if not stopped. For example, the average score for the Mathematics portion of the ACT has remained essentially stable since 1976, and the average score on the English portion has not changed at all in the past three years (1978-1980). Data from the National Assessment of Educational Progress (NAEP) may also be showing a halt to the long decline in achievement scores. Although an NAEP report on

mathematics (NAEP, 1979) found significant declines in mathematics scores (an overall drop of 2% at age 13, 4% at age 17) between the years 1973 and 1978, a more recent NAEP report on reading (NAEP, 1981) found no significant change in reading scores for 13- or 17-year-olds between 1975 and 1980 and significant gains (more than 2%) for 9-year-olds over that same period.

One of the more interesting observations in the NAEP report on reading was that, for all three age groups over the years 1970 to 1980, changes in achievement scores were more positive for low achievers than for high achievers. That is, the average score for the lowest 25% tended to increase over the 10 year period, while the average score for the highest 25% did not increase (or actually declined). For example, while average reading achievement scores for 13-year-olds showed no overall significant change between 1970 and 1980, the average score for the lowest 25% increased significantly, while the average score for the highest 25% decreased significantly. Apparently, different things may be going on at different levels of achievement.

Public Opinions About Education

Since 1969, a series of annual Gallup polls has measured the public's attitudes toward education. The most recent of these polls (Gallup, 1981) indicated that during the period 1975 to 1981 there was a decline in the ratings given by the public to the public schools. Respondents were asked to rate the public schools using the grades A,B,C,D, or FAIL. Whereas 43% of the respondents gave an A or B rating in 1975, only 36% of respondents gave an A or B rating in 1981. When

people were asked to name the major problems facing the public schools in their own communities, "discipline" continued to be cited most often (by 23% of respondents). Second place went to the "use of dope and drugs" (15%). Named in third place was "poor curriculum and poor standards" (14%). When asked to grade how well the public schools are doing in providing education in nine subject areas, only 35% gave the schools an A or B rating for Vocational training while 21% gave a D or FAIL rating.

Although schools have been placing more emphasis on basic education, parents of children attending public schools said that not enough attention was being given to the basics. When they were asked in the 1980 poll (Gallup, 1980) if the local school system gives enough attention, or not enough attention, to reading, writing, and arithmetic, 61% of them responded "Not enough attention." Despite, or perhaps because of, their concerns about the quality of education, 82% of the respondents in 1980 viewed school as "extremely important" to one's future success. How would the general public try to improve education? The four most popular responses (from a list of 14 suggestions) were: 1) well-educated teachers and principals; 2) emphasis on basics such as reading, writing, computation; 3) teachers and principals personally interested in progress of students; and 4) good parent/teacher relationships.

In some respects, the findings in the Gallup surveys are similar to the findings in a Utah PTA survey (Utah Congress of Parents and Teachers, 1980). Some of the major conclusions emerging from the Utah survey were:

- (1) When presented with a representative list of 34 typical programs and courses offered in the public schools, Utah citizens responding to the survey rated a very large majority of these courses and programs as either "very important" or "extremely important." The lowest rating for any course or program was slightly below "moderately important." Thus, this set of typical program offerings in the public schools is generally very highly valued by Utah citizens.
- (2) Ratings of "extremely important" were typically attached by Utahns participating in the study to the "traditional" academic areas, with subjects such as English, mathematics, reading, science, and social studies all receiving very high levels of endorsement. The desire for strong emphasis on such areas and less emphasis on "electives" and extracurricular activities was apparent throughout the study.
- (3) In addition to the academic areas mentioned above, several other programs received very high levels of endorsement. These included training teachers to keep skills up-to-date, special education for handicapped and learning disabled students, counseling and guidance, career exploration and planning, health education, physical education, trade and industrial training, driver education, and pupil transportation along hazardous routes.

Although the focus of the Utah survey differed from that of the Gallup survey, in both cases respondents seemed to be indicating that school is very important, and that there should be an emphasis on the traditional academic areas—reading, writing, mathematics, science, etc. The Utah survey in particular indicated, however, that the basics (reading, writing, and arithmetic) are not the only important programs in public schools.

Minimum Competency Requirements

The public perception of a need for more emphasis on the "basics"—reading, writing, arithmetic—is probably caused partly by the

controversy over declining achievement scores. One response to declining achievement has been a movement toward minimum competency testing. Information contained in The Condition of Education, 1981 Edition (Dearman & Plisko, 1981) showed that by 1979, 31 states had adopted state-level minimum competency standards. All of these states required assessments in reading and mathematics, and more than half specified testing in the language arts. Only six states limited the competency testing to the 9th through 12th grades, and about one-third of the states mandated testing in the elementary grades, suggesting that states regard minimum competency testing as an on-going process and one not limited to assessing secondary school students as they prepare to graduate.

Not everyone agrees that minimum competency testing is an appropriate response to achievement score declines. Farr and Olshavsky (1980) argued that achievement score declines in the SAT and ACT reflect drops in higher level abilities, not basic abilities, and that minimum competency testing does not measure these higher level skills. They argued that the SAT measures performance that is far above the skills needed for basic survival in a literate society. Declining SAT scores may tell us very little about the basic literacy of high school students. Farr and Olshavsky noted that tests of more basic skills, such as the NAEP tests, show that basic literacy is already at a very high level, and conclude that what is needed is "increased emphasis on higher-level reading/thinking skills" (p. 530).

Unfortunately, there has been precious little empirical research directly examining the effects of minimum competency testing on student

achievement. No one has reported concrete data to demonstrate whether the imposition of minimum requirements motivates improvement in any part of (let alone throughout) the broad spectrum of student achievement. Without that information, the controversy about minimum competency requirements rages in a vacuum.

Issues of Educational Assessment Methodology

Some of the studies previously cited have discussed how educational research or assessment should be conducted. For example, Averch et al. (1972) identified six major issues as possible directions for movement by educational research. They were:

First, research must examine the extent to which, and under what conditions, learning takes place outside the school. Second, the concept of interactions must be more deeply investigated. Third, the vastly different forms of education that have been suggested as alternatives to the present system should be investigated. Fourth, we must begin to examine educational outcomes over time and on many dimensions. Fifth, the approaches must be merged. Each offers insights not available to those who work in the others. Each has blind spots. There have been far too few attempts to use the strengths of one approach to overcome the weaknesses of another. And, sixth, analysts must recognize the cost implications of their results. (pp. xii-xiv)

Bridge, Judd, and Moock (1979) not only reviewed the types of things that affect student achievement, but also emphasized methods for determining which inputs affect educational outcomes. They made several recommendations, some of which were:

- (1) Look for new and better input measures, such as measures of classroom process, family processes, etc.
- (2) Use longitudinal data and time series analysis to follow the progress of students through school and assess the extent to which different inputs create different outputs.

- (3) In examining the effects of inputs, consider the possibility that variables may affect each other reciprocally. For example, affective inputs (such as locus of control beliefs) are both a cause and result of cognitive achievement. Methodologically, this suggests the use of "non-recursive" statistical models to look for reciprocal causation.
- (4) Test for interactions among inputs. For example, well-equipped school libraries may enhance the achievement of high-ability students but not low-ability students. This suggests the use of interaction terms in linear regression models and the use of multiplicative models.
- (5) Attend to the effect of inputs on subgroups of students. For example, it may be more socially desirable to raise the achievement level of students currently at the top of the achievement distribution than to raise the performance of students at the bottom.
- (6) Consider a cost-effectiveness criterion when making recommendations for ways to increase achievement. The criterion for assessing the impact of an educational input should be its cost effectiveness relative to other inputs.

Coulson (1978) reviewed evaluations of the Emergency School Aid Act (ESAA) and pointed out the difficulties which characterize many large-scale measurement studies. The methodological issues identified in Coulson's review were as important as the evaluation findings. The evaluation showed that students' basic achievement tended to be greater in schools which: 1) had a principal who exercised strong administrative leadership; 2) had greater program funding and instructional resources; 3) provided instruction with a high degree of focus and structure; and 4) made visible efforts to promote equal educational opportunity for all students.

The findings also pointed to several crucially important methodological issues. First, there should have been some measurement of how well the treatment was implemented. The "treatment" schools often did not receive more funding than the "control" schools, even

though the treatment was supposed to be "more funding." Secondly, the gains in student achievement under the Basic Program did not become evident until the third year of implementation; judgment based on the first two years would have been premature. Taken together, these two points strongly urge that evaluations of educational projects should focus for the first one or two years on formative data concerning the degree of implementation, and then assess outcomes later on. In addition, measures of student achievement within a specific program need to be more criterion-oriented toward mastery of specific learning objectives, rather than merely designed to indicate student standing compared to a normal reference group. This is particularly important since most normal reference groups do not include large numbers of the types of students involved in compensatory education programs.

Guest, Ellison, and Fox (1980), in a special report for the Utah Statewide Educational Assessment Project, reviewed educational research dealing with the identification and measurement of processes occurring in the classroom that impact on student outcomes. On the basis of that review, the report made seven recommendations, the first three of which directly affected the 1981 Utah Statewide Educational Assessment:

- (1) Assessment should examine tangible, observable processes rather than diffuse, unobservable climate variables. The measurement of observable processes is more likely to be reliable and verifiable, whereas unobservable climate variables are harder to quantify and change.
- (2) Assessment should spend more effort giving feedback about the educational processes. This is a key step in bringing about effective new procedures. The previous Utah Statewide Educational Assessment Projects have provided school-level feedback about selected processes and have had the capability of providing classroom level feedback. Educators must develop the willingness and capability to

deal with this kind of feedback.

- (3) Assessment efforts should continue to collect data longitudinally to monitor progress and identify process variables that are related to changes in student outcomes.
- (4) Research should develop a method of economically assessing "time-on-task." Extensive use of observers is impractical, and student self-reports are very likely unreliable.
- (5) The general area of "home environment processes" should be investigated to determine how these processes can be altered to achieve beneficial outcomes.
- (6) Measures of classroom climate should be validated against student outcomes. More attention should be focused on the ways in which classroom climate influences academic achievement, social maturity, productive-thinking skills, etc.
- (7) Future research should deal with student desire and willingness to learn, a topic which has received limited attention in previous studies. Student motivation is obviously related to student achievement, and an important question is: how can teachers increase motivation? (pp.17-18)

Summary

The Utah Statewide Educational Assessment Program has capitalized on studies in other states and on the national level that have been concerned with the effectiveness of the educational system in providing a quality education for students. Important implications and recommendations from these other studies have been used in the formulation of this program.

Because of the findings of past studies, this program investigated variables that are not typically found in statewide assessment studies, such as educational process measures. The emphasis on measuring the development of students on the Social Maturity, Productive Maturity,

Emotional Maturity, and Aesthetic Maturity goals is also not typical of other state assessment programs.

CHAPTER III

DEVELOPMENT AND ADMINISTRATION OF MEASUREMENT INSTRUMENTS

Basic Rationale

Assessment Based on Goals

The educational outcomes examined in the Utah Statewide Educational Assessment were largely guided by the set of state goals formalized in 1972. A brief review of the educational assessment programs of other states and national assessment programs shows that the specific content and strategies of assessment programs vary widely. Some assessment programs are completely based on a nationally published, norm-referenced, standardized test. Others focus on measuring educational performance through the use of very specific educational objectives and test items which have been termed criterion-referenced; this means that the interpretation of results is based on the test content rather than a comparison to a national or local norm group. Both the standardized test approach and the objectives-based or criterion-referenced measurement approach to assessment tend to measure educational performance across a rather narrow band of possible educational outcomes. Typically, these have centered around classical educational curriculum areas such as mathematics, reading, science, and social studies.

A few programs have gone beyond these traditional academic areas in attempting to measure student outcomes related to broad educational goals. As stated earlier, the present assessment program is in this

general class. The decision to measure educational outcomes suggested by goals such as those Utah has established is based on two major assumptions: 1) an assessment program should measure performance in a wide range of areas reflecting the competencies, knowledge, and attitudes which the educational system works to foster; and 2) measurement instruments, with credible scientific properties, can be identified or constructed to accomplish the measurement suggested by broad educational goals. The first assumption is largely a matter of philosophy, while the second assumption can be and was, as part of the assessment program, tested to provide psychometric evidence.

Standardized, norm-referenced tests have a legitimate place in educational measurement; they do provide information about comparative levels of achievement which educators and the general public want and need. Likewise, specific objectives-based or criterion-referenced approaches to measurement have their own utility. Objectives-based measurement is by far the most useful approach to testing for classroom teachers as they make day-to-day decisions about student needs and attainment of educational objectives. The notion of measuring attainment of very specific objectives has a place in measuring the performance of larger educational units as well.

The goal-based measurement of this project, while paying attention to what has been measured traditionally through achievement tests, goes beyond the classic achievement areas to obtain data on other crucial areas of educational endeavor. The measurement related to the goals which were presented in Chapter I is not purported to be a comprehensive assessment of each of the specified goals. Even a casual examination of

these goals demonstrates that they are too broad to be measured exhaustively, and, in most cases, lack the specificity which might be provided in the form of more restrictively defined objectives. Thus, the approach here focused on analysis of the goals and their related general objectives with subsequent identification of several key measurement areas which might serve as indicators of educational performance with respect to each goal.

Research Approach to Assessment

Utah Statewide Educational Assessment endeavored to measure more than student performance alone. During the planning of the Statewide Assessment studies, a thorough review of related literature supported the authors' conviction that the measurement of student outcomes must also be accomplished with measurement of key factors descriptive of conditions and educational procedures which influence performance. Thus, besides the goal-oriented student performance measures included in the study, other important classes of variables were measured. These included educational process measures, such as teacher emphasis on reinforcement of self-concept and degree of student classroom participation; other variables such as class size; and student characteristics, such as race, socioeconomic status, and sex.

A research design which provides a cumulative data base can take advantage of the data collected by making longitudinal and current comparisons, thus providing greater perspective for the results. The results of such research can provide broad implications for improving the educational system. The Utah approach to assessment allowed for a more detailed examination than has been accomplished previously within

the state, not only of levels of performance but also of important demographic and educational process factors which are related to levels of performance.

Identification and Construction of Measures

Selection of Existing Measures

The 1981 assessment benefitted from the psychometric developmental effort expended in the 1975 and 1978 studies. This experience enabled the researchers to make decisions concerning new and existing instrumentation. Scales from existing published standardized measurement devices were included in the Statewide Educational Assessment. These were the mathematics subtests (which were used in the 1975 and 1978 studies) and the reading subtests (which were first used in the 1978 study) from the Comprehensive Tests of Basic Skills (Form S, Levels 2 and 4), published by McGraw-Hill. In the judgment of the present authors and program specialists of the State School Office, these measures did an adequate job of measuring these domains. As stated previously, maintaining measures used in 1975 permitted comparisons of current results to those obtained earlier, and thus any changes that may have occurred could be examined. The decisions to include these scales were based on considerations of the content measured by the tests and their psychometric properties, such as the demonstration of various kinds of reliability and empirical validity.

Construction and Refinement of New Measures

A list of the measures used in the 1981 study is presented in Exhibit 1. The majority of the measures presented in Exhibit 1 were based on instruments specifically constructed to measure aspects of the Utah Goals. Most of the measures of the Emotional Maturity, Social Maturity, Aesthetic Maturity, and Productive Maturity Goal areas were developed specifically for the 1975 Utah Statewide Educational Assessment; information concerning these scales is presented in the 1975 reports. The educational process and certain other measures were constructed through studies prior to 1975 by IBRIC staff and were subsequently revised and refined for application in Statewide Assessment. Other scales, including Art Achievement and the Economic Awareness and Consumer Competence Scale, were specially constructed for the 1978 study. Finally, a special set of cognitive mathematics items was constructed in 1981 for use at the 11th grade, as was a scale for Mathematics Class Experience. During the early stages of development of the instruments for each of the goal areas, the appropriate State School Office curriculum specialists were consulted.

Selection of the Sample

The students who participated in the 1981 Utah Statewide Educational Assessment Program were in the 5th and 11th grades. These grades were chosen because they are close to the end of the elementary and secondary levels and because the students would typically still be in the same school settings a year later. The participating students and schools could then benefit from the feedback given to schools by the

Exhibit 1

Measures Used in the 1981 Utah Statewide Educational Assessment

I. MEASURES FROM STUDENTS

- A. INTELLECTUAL MATURITY GOAL: From the Comprehensive Tests of Basic Skills, Form S, Levels 2 and 4, the CTBS Mathematics and Reading sections were administered at grades 5 and 11; and special mathematics questions at grade 11.
- B. EMOTIONAL MATURITY GOAL: Three positive indicators--Academic Self-Concept, Self-Acceptance, and Autonomy--at grades 5 and 11.
- C. SOCIAL MATURITY GOAL: Peer Relations at grades 5 and 11, and Extra-Curricular Activities at grade 11 only.
- D. AESTHETIC MATURITY GOAL: Art Achievement and Music Achievement at grades 5 and 11.
- E. PRODUCTIVE MATURITY GOAL: Independent Development at grades 5 and 11; Career Awareness and Exploration, Career Development Experience, and Economic Awareness and Consumer Competence at grade 11 only.
- F. EDUCATIONAL PROCESS: Individualization of Instruction, Reinforcement of Self-Concept, Classroom Participation, Development of Career Talents, and Expectations at grade 5 only.
- G. SUPPLEMENTARY MEASURES: Enjoyment of School, Mathematics Background, Reading Background, Demographic Data, Socioeconomic Status--Financial, Socioeconomic Status --Educational, and Socioeconomic Status--Total at grades 5 and 11; and Mathematics Class Experience at grade 11 only.

II. MEASURES FROM PRINCIPALS AND RECORDS

- A. ELEMENTARY SCHOOL PRINCIPAL QUESTIONNAIRE: School population characteristics, Title 1 versus non-Title 1, architecturally open school versus other, etc.
- B. RECORDS: School size and location (urban, suburban, rural).

project.

The basic sampling approach which was employed involved the selection of a stratified random sample of schools. Thus, a sample of elementary and high schools was selected which was representative of the elementary and high schools in the state. Selected for the sample were 67 elementary and 30 high schools.

At the 5th grade, all students were tested in each of the selected elementary schools, providing screened data on approximately 4,000 students. This sample size was selected to permit analyses at the individual student and classroom levels.

At the 11th grade, additional complexities were involved. The 1975 study confirmed that isolating classroom effects on 11th grade student outcomes was difficult in state assessment studies, since the students rotate across classes. Thus, only the individual level of analysis was relevant on the secondary students. In view of this, a within-school sampling strategy was developed to provide reasonably stable means for school feedback reports, but not to burden the study with relatively expensive data collection and data processing procedures. Thus, a set of decision rules was adopted such that, in schools with 110 or fewer 11th grade students, all 11th grade students were tested. In larger schools, a minimum of 110 11th grade students were tested, or 20% of the 11th grade student population, whichever was larger. (However, each school was given the option of testing all its students.) To select students within each school, a roster of 11th grade students was obtained, the appropriate number of students was selected using a random number table, and the schools were sent the list of students selected.

This permitted the feedback report for each school to be based on approximately 100 or more randomly selected students, depending on how many survived the data quality control screens. The procedure provided data which were reasonably accurate in representing school means while still maintaining economy considerations. This strategy resulted in screened data on approximately 2200 students at the secondary level, which provided substantial accuracy on statewide data concerning educational effectiveness. However, because the sampling procedure under-represented the numbers of students in large high schools, a "selected sample" was drawn to get data representative of the state as a whole. Since the minimum percentage of students tested in any one of the sampled schools was 12% of the school's grade 11 population, the selected sample consisted of 12% of the total grade 11 population in each sampled school (drawn randomly from among the students tested in that school). The resulting selected sample of about 750 secondary students was representative of the entire state and enabled accurate estimates of the statewide statistics on the measures studied.

The sample was evaluated on the basis of a number of variables that were of importance or interest to the project. Included among these variables were Title I versus non-Title I schools, size of school, and type of community within which the school was located (urban, suburban, rural). The random samples of 5th and 11th grade schools selected were generally comparable to the population on all variables.

Naturally, not every district in the state had schools drawn for the sample, since the project was not designed to make district by district comparisons. The results of the project cannot be used to

compare the students from one district to another, nor can the results from the students sampled in one district be used to represent all the students within that district. The results found in the project can be used to indicate the general level of effectiveness of the educational system within the State of Utah as a whole.

The numbers of students who took each part of the test battery can be found in Appendix A. Data were available on differing numbers of students for the various measures because the battery was administered across a number of school days, with not all students present on all days, and because some responses of some students were rejected by computer quality control screens.

Administration of the Measures

The administration of the Comprehensive Tests of Basic Skills (CTBS) and the custom-built test batteries took place primarily during the last two weeks of April, 1981. The last two weeks of April were specified for the administration, since May is often filled with activities related to the end of the school year and the student responses could be less reliable because of various extraneous events. The dates of administration corresponded quite directly to the dates of administration of the 1975 and 1978 assessments, so that comparisons can be made across the three studies.

The necessary test administration time for the entire battery was approximately five hours. The elementary schools were asked to divide the administration into time blocks spread over five days, and the high schools were asked to divide the testing into at least two segments.

Test Administrators

Since school counselors have had training in test administration and would understand the need for standardization, they were the logical choice for conducting the testing sessions at the high school level. For elementary schools, substitute teachers regularly used by the schools were chosen to administer the battery. Regular classroom teachers were not used as test administrators to avoid the possibility of any inadvertent influence on the responses of the students. This also would have imposed a burden on classroom teachers who might typically have little experience in standardized testing procedures nor time for training. The use of trained substitute teachers increased the standardization of the administration.

From a group of substitute teachers normally used by the school, at least two were nominated by each principal or liaison person as being especially competent. The substitute teachers so nominated were then called and asked if they would serve as administrators of the battery and assist in arranging with the principal for the time and place of administration.

Training of Test Administrators

Four workshops were held in various locations throughout the state for those people who were to serve as test administrators. Each workshop lasted approximately two hours and was designed to: 1) acquaint the administrators with the project and its goals and objectives; 2) establish the procedure to be followed in the administration; 3) answer any questions that the administrator might have about the project; and 4) distribute the materials to be used.

Since the procedure to be followed during the administration varied by grade level, and since the secondary school workshop was generally concerned with a sampling problem, the two groups were separated during the workshop. This allowed Assessment staff to work with smaller groups of administrators and to give more personal attention to any questions that administrators might have.

The four workshops were held in Salt Lake City, Ogden, Provo, and Beaver, which meant that some administrators, as well as project staff, had to travel some distance to attend. The locations of the workshops represented a compromise between requiring all administrators to attend workshops at one central location and having the staff travel to each participating district.

The testing materials were distributed to the administrators at the workshops. The number of materials distributed was based on the number of students at the specified grade levels in the schools as reported by the district liaison person. Some minor inaccuracies were found in this number, due to transfers not reported to district offices. Separate administration manuals were prepared for the 5th and 11th grade administrators, and these were distributed during the workshops. The manuals were designed to lead the administrators step by step through the whole testing procedure. Following the administration manual increased the likelihood of standardized testing procedures for all schools.

The reading level of the 5th grade battery was determined to be too high for a small percentage of the students who were reading below their grade level. So that the information obtained would not be influenced

by reading ability, the manual and the workshops specifically instructed the 5th grade administrators to read the questions, other than the CTBS portion of the battery, aloud to the students. This helped to ensure that all students understood the questions and held constant the time required to take the battery both within and across schools.

Scheduling of Test Administration

Prior to the workshops for test administrators, each superintendent of schools in districts with schools in the sample had been informed by a letter from State Superintendent Walter D. Talbot when the Statewide Assessment was going to take place, that IBRIC was to be involved, and that the district superintendent would be kept informed of the progress of the project. In this letter, each district superintendent was asked to name a person within the district's organizational structure who would act as liaison between the district and the Statewide Assessment Program. The liaison person was then informed of the schools in the district which had been selected as part of the sample and was asked to notify the principals of those schools of their involvement in the assessment. In addition, the Assessment staff communicated directly with participating schools' principals to provide them with an outline of project activities, time requirements, etc.

After the training workshops, each test administrator contacted the principal of the school to which he or she was assigned to make final arrangements for testing. At the completion of testing, each administrator was to return the materials to IBRIC or to the district liaison person.

In general, the comments received from principals, teachers, and test administrators indicated that the testing went very smoothly, considering the numbers of students and schools involved, although future assessments may need to consider additional strategies to ensure a high rate of participation among the 11th grade students. Further comments suggested that the workshop sessions were adequate in providing the training that was necessary for the administrators, and that the manuals were complete and sufficient. Standardization of the testing procedure appeared to be consistent across locations. No administration problems of sufficient magnitude were identified that would necessitate caution in the interpretation of the results.

Personal Privacy

On the test booklet that was given to each student, and in the administrator's manual, the following statement was emphasized and was read simultaneously by the administrator and the students. "If there are a few questions which, for personal reasons, you do not wish to answer, you may leave them blank." Each student was allowed to use his/her own discretion in determining the applicability of each item. No item within the test battery was judged to be discriminatory, demeaning, or derogatory. However, recognizing that a student might interpret an item in such a manner, a heavy emphasis was placed on this statement and the student's right to choose not to answer specific questions.

To ensure the confidentiality of the responses, each student was given a code number to use on the answer sheet. The students had to put their names on the CTBS answer sheet, because individual results for the

Reading and Mathematics tests were supplied to the schools. These tests complemented those included in the regular testing procedures of the participating schools and made better use of the data collected for the Statewide Assessment. However, after the data were merged by IBRIC, student name was no longer on any records. Except for the CTBS Mathematics and Reading achievement scores, no individual student scores were reported in any way to the schools. On all other measures, school level data (i.e., average scores for all students participating from a given school) were used for all the feedback reports to schools. No student names have been retained as part of any record of the project other than those supplied to the schools in conjunction with the Mathematics and Reading scores.

Data Processing and Analyses

Preparation and Initial Processing

After the testing was completed, each student placed his/her materials in a separate envelope. These materials were not seen by the teachers or other personnel at the school. These envelopes were returned to IBRIC, either by test administrators or through the liaison person. Upon receipt at IBRIC, the materials were removed from the envelopes, sorted, and given a preliminary check of code numbers. The CTBS answer sheets were assigned special coding and scored by the Education Support Service Division of the State School Office, which provided feedback for the CTBS Mathematics and Reading tests for each individual student in each school and average data for each school. They also provided a computer tape so that other types of analyses of

the data for the Intellectual Maturity Goal area could be carried out, including how this area was related to measures in other goal areas.

The answer sheets for the custom-built scales were optically scanned and the data prepared for processing on the University of Utah Computer Center Univac 1100/61. The first statistical processing was screening of the major sections of each student's response for bad data. Of these screening procedures, the first involved counting the number of missing or "illegal" responses made by an individual in each section of the battery. Illegal responses were those which, though available on the answer sheet, did not correspond to an available alternative to the question as printed in the battery. If more than 10% of the response positions on a non-cognitive section in the battery were blank or illegal, that portion of the battery was deleted altogether for that student.

The second screen involved summarizing each major section of the test battery to ensure that students answering sincerely would be retained but most cases of purely random data or students answering in an extremely rigid manner would be deleted (Fox, 1981). For the other non-achievement sections of the battery, if the student had data deleted for two major sections so screened, he/she was probably not answering sincerely and thus should have the data for the remaining non-achievement section of the battery deleted also. Following this screening, the data from the custom battery were ready for merging with the CTBS data and for the development of the final scoring procedures and analyses.

Statistical Analyses

The scoring keys for most scales used in the 1975 and 1978 studies were carried over to the 1981 study. However, there were some changes in the scoring keys for the Mathematics Background scale and the Economic Awareness and Consumer Competence scale, due to reductions in the numbers of items used in these scales. Also, new keys were required for the Mathematics Class Experience scale and the special set of cognitive mathematics items, both of which were newly constructed for 1981. The keys for these scales were evaluated through item analysis techniques to make sure they were effective measures. The final set of scoring keys was then applied to the responses of all the students in the total statewide sample. The resulting scores, plus those for the CTBS tests, were then analyzed to produce the results discussed later in this report. The analyses performed included computing the means, medians, standard deviations, and intercorrelations for all the scales for the total 5th grade and 11th grade samples. Item alternative response frequencies at each grade level were also computed.

As part of the data collection, special coding (defining district, school, and homeroom class membership) was affixed to each student's record. This coding allowed combining individual level data for classroom averages. Also, this coding was used to merge student data with information about school characteristics (such as size and location).

Organization of Results Chapters

In the five chapters which follow, each goal area is treated separately. Each chapter consists of a statement of the goal, a description of the scales used in the area, and a presentation of the results obtained on each of the measures to provide information about the levels of performance and activities of Utah students included in the study. Information concerning the measures used throughout the study can be found in Exhibit 1 and in the appropriate chapter dealing with the corresponding goal. This descriptive information about level of performance is followed by a description of how a key measure from each goal area was related to other measures included in the study. The relationships between the key measure for each goal area and all other measures will be presented for the 5th and 11th grade students. For the analysis of classroom process on 5th grade students, interrelationships among the classroom means for the process measures and outcome measures will be presented. These results will be followed by a discussion of school level data (urban, rural, etc.) on 5th and 11th grade students.

The five goal-based results chapters are followed by chapters on Enjoyment of School, Educational Process Measures, and School Classifications and Demographic Characteristics. These latter chapters are also organized by descriptive findings and relationships.

The study was descriptive and correlational in nature, rather than experimental. From this kind of design, no claims of causality can be made. Additional analyses and extended research, much of it longitudinal and experimental in nature, would be necessary to permit more deterministic conclusions. While all available data indicate that

the sample of schools was generally representative of all Utah schools, caution must be observed in making inferences about specific schools, classes, or students.

Even with these qualifications, the 1981 Utah Statewide Educational Assessment provided substantial information about student performance on a variety of measures, the interrelationships of student outcomes and teaching process measures, and other characteristics of concern to Utah educators and the general public.

CHAPTER IV

RESULTS FROM THE INTELLECTUAL MATURITY GOAL AREA

One's intellectual maturity is exemplified by a continuing desire for understanding, a continuing interest in current problems, a continuing accumulation of knowledge, and an increasing ability to use one's rational powers. (Utah State Board of Education, 1973)

The general objectives for Intellectual Maturity include assimilating data from a variety of sources and experiences, objectively evaluating these inputs, altering the student's attitudes and behavior, and contributing to society by using this new knowledge.

Description of the Measurement Instruments

After an extensive review of available measuring devices, which included considerations of item content, technical characteristics (such as reliability and validity), testing time, costs, and compatibility with the Utah Intellectual Maturity Goal, the Comprehensive Tests of Basic Skills (CTBS) Form S, Levels 2 and 4, were selected for use in the Utah Statewide Educational Assessment. One of the important considerations in the selection of the CTBS was the classification of items into intellectual process and subject content categories, which provided the means for obtaining additional information about the performance of Utah students. The sections of the CTBS selected were Mathematics and Reading. The mathematics portion yielded scores for Mathematics Computation, Mathematics Concepts, and Mathematics Applications, in addition to a Total score. The reading portion yielded

subscores for Vocabulary and Comprehension. In addition to these major subscores, item content categories in both Mathematics and Reading were available to provide supplementary diagnostic information about the performance of the students.

As part of the 1975 assessment, judgments from 5th and 11th grade teachers were obtained regarding the importance of the specific content of the CTBS Mathematics test. These teachers were asked to rate each content and process category on its relative importance, using a standard rating scale ranging from "not very important" to "extremely important." In general, these categories were rated as "very important" by both 5th and 11th grade teachers indicating that the content of the mathematics achievement test was viewed as important by Utah teachers. Similar judgments were obtained for the reading test in the 1978 assessment through a careful review by reading specialists and psychologists.

Due to concern about declining 11th grade mathematics achievement, the 1981 assessment included a set of 32 special mathematics items, largely of a criterion-referenced nature, to supplement the CTBS mathematics items at the 11th grade. These special items were mainly drawn from the National Assessment of Educational Progress item pools and covered key elements of a basic mathematics curriculum. The items dealt with a range of content categories from basic consumer mathematics to algebra and geometry. The set of special items was carefully reviewed by mathematics specialists and psychologists.

CTBS Results for Grade 5

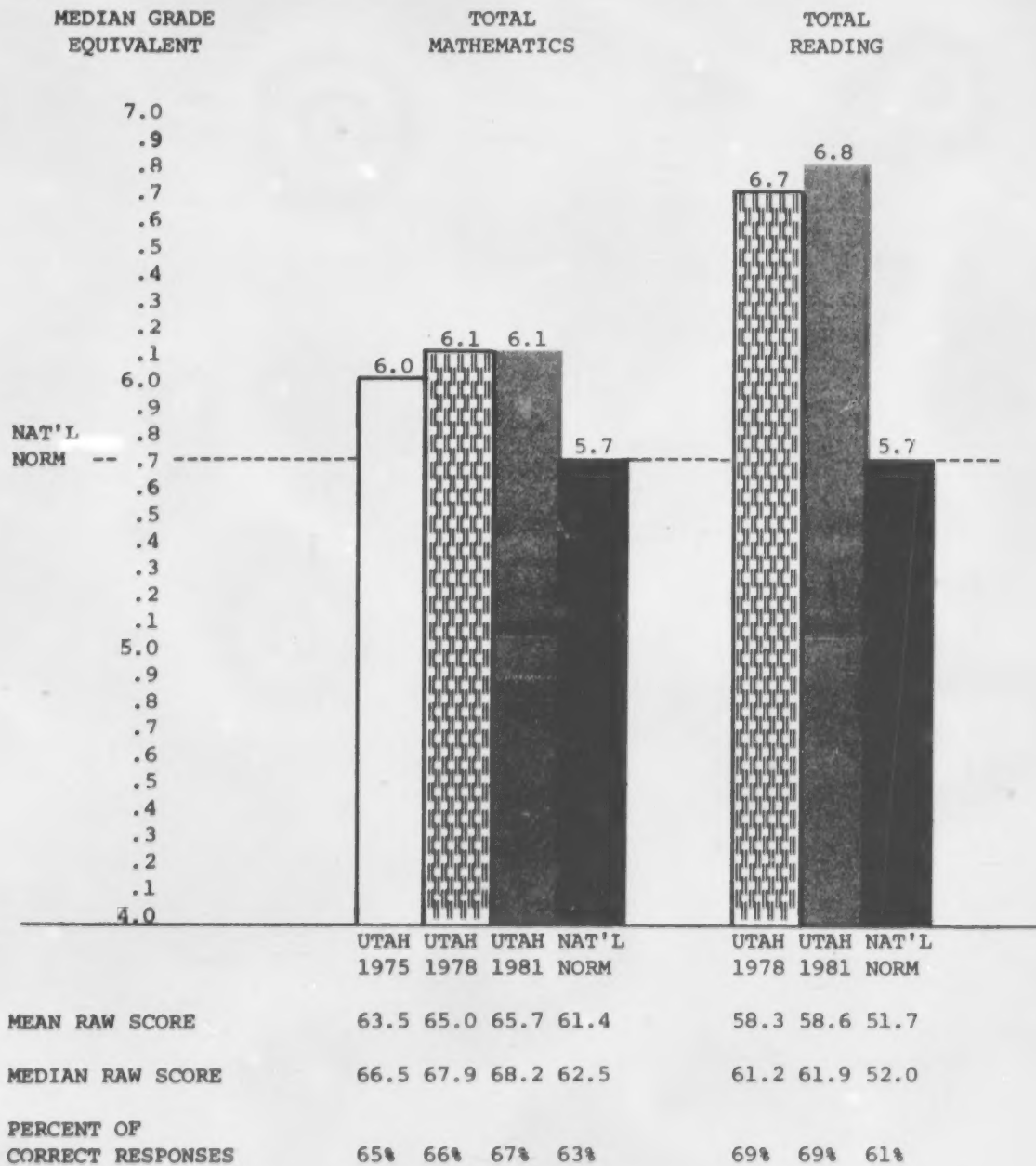
The total score results on Mathematics and Reading for Utah 5th grade students and for the national standardization sample are compared in Exhibit 2. Median grade equivalent scores (the point below which 50% of the students scored) were used to allow comparisons to the national sample for all score areas. The national grade equivalent score was 5.7, reflecting the median performance of 5th grade students at the seventh month of their academic year.

The results showed slightly higher levels of performance for the Utah students tested in 1981 compared to the national standardization group and to the Utah students tested in 1975 and 1978. On the CTBS Mathematics Total score, the 1981 Utah sample performed slightly above the 6th grade level of the national sample. For the total Reading score, the difference between the Utah results and the national standardization sample was marked. Utah students clearly surpassed the national sample; the comparative grade equivalents were 6.8 for the Utah 1981 sample versus 5.7 for the standardization sample. (Note that the reading test was not administered in 1975.)

Additional data are presented on the lower part of Exhibit 2 to provide more information about the standings of the Utah 5th grade students in relation to the national standardization sample. To illustrate, the mean raw Mathematics Total score indicates that the 1981 Utah sample answered approximately four more questions correctly than did the national sample. For Reading, the Utah sample answered about 7 more questions correctly than did the national sample.

Exhibit 2

Utah vs. National Results on Comprehensive Tests of Basic Skills Mathematics and Reading Total Scores, Grade 5

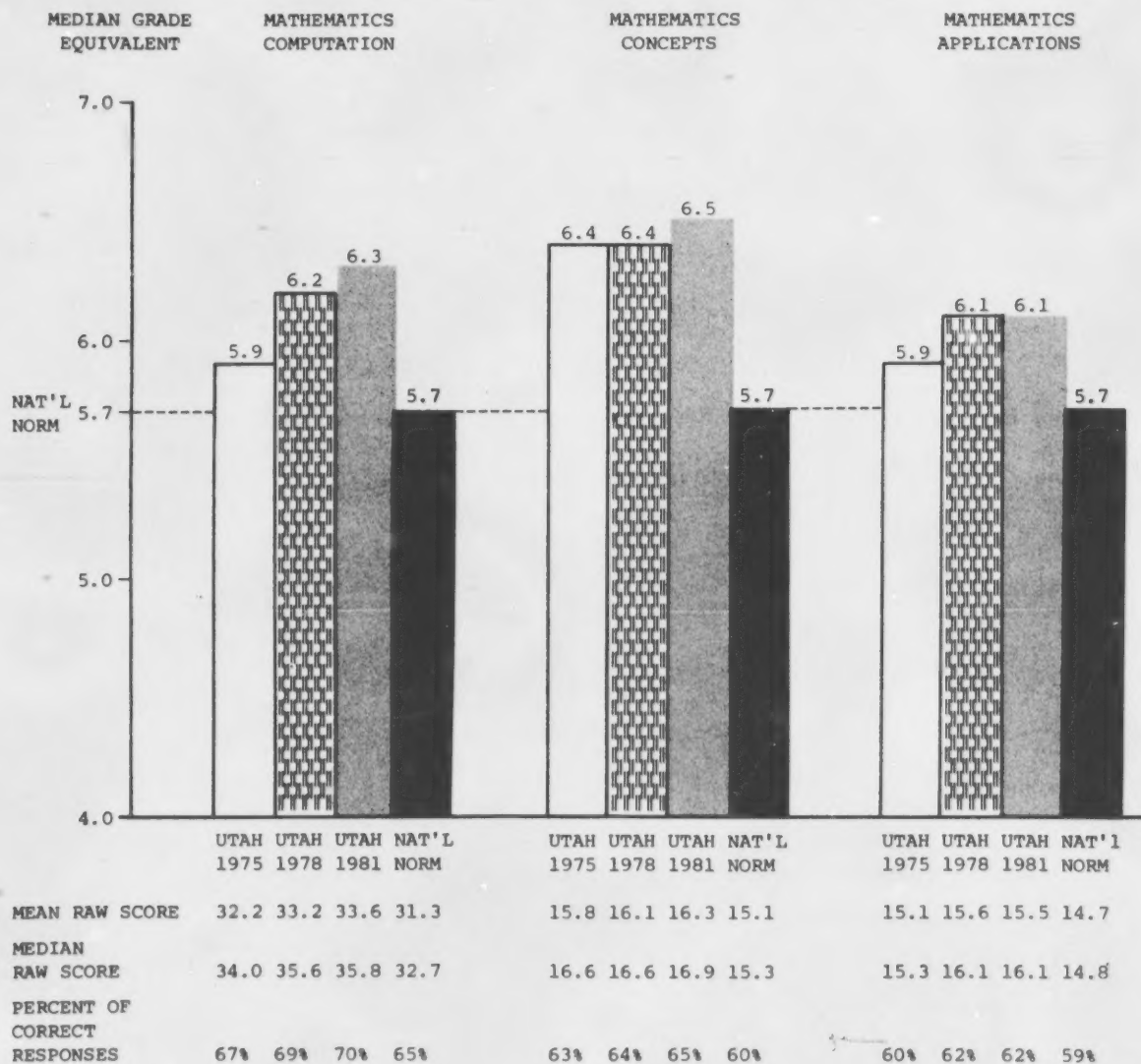


A similar picture of higher levels of performance by the Utah students is obtained by considering the median raw score and the percent of correct responses shown at the bottom of the exhibit. The median raw score, representing the score of an average student, is reported because the CTBS score distributions, and achievement test results in general, are "skewed": relatively few very low scores pull the arithmetic mean below what would usually be considered a "typical" or "average" score. The median raw Mathematics Total score shows that a typical Utah student in 1981 answered about six more questions correctly than did a typical student in the national sample. The 1981 Utah sample answered 67% of the mathematics questions correctly, compared to 66% in 1978, 65% in 1975, and 63% in the national sample. As noted above, the results were more marked for Reading: a typical Utah student, as defined by the median raw score, in 1981 answered about 10 more questions correctly than did a typical student in the national sample; 69% of the questions were answered correctly by the Utah sample, compared to 61% by the national norm group.

Subscore Results for Mathematics

Exhibit 3 presents the results for the major subscores of the CTBS Mathematics test for the 1975, 1978, and 1981 Utah samples and the national standardization sample. These results provide additional information about the 1981 results and how they compared to those obtained in 1975 and 1978. There were gains in 1981 in all three subscores compared to 1975, although only Mathematics Concepts was significantly higher in 1981 than in 1978.

Exhibit 3
Utah vs. National Results on
Comprehensive Tests of Basic Skills
Mathematics Subscores, Grade 5



In the lower part of the exhibit, information is presented on the mean raw score, median raw score, and percent of items answered correctly for the Mathematics subscores. To illustrate, the Computation raw score median for the Utah students was 34.0 in 1975, 35.6 in 1978, and 35.8 in 1981, whereas the national sample median was 32.7; these results indicate that a typical Utah student in 1981 answered approximately three more questions correctly than did a typical student in the national sample. As in the previous exhibit, the last row in the exhibit presents the percentage of questions answered correctly.

The median grade equivalent for the Mathematics Total (shown in Exhibit 2) is not a simple average of the median grade equivalents for the Mathematics subscores (Computation, Concepts, and Applications). There are two reasons for this. The first reason is that a simple average does not reflect the fact that some subscores have more items than others and therefore have a greater impact on the Total score. The second reason is that each of the grade equivalent distributions is shaped differently. These factors together result in a Total grade equivalent that is different from a simple average of the subscore grade equivalents.

Results on Specific CTBS Mathematics Content Categories

Further results from the CTBS Mathematics section can be found in Exhibit 4, which presents the average percentage of questions answered correctly at grade 5 for each of the specific content categories within the CTBS Mathematics test. As expected from the major score results, the 1981 Utah sample scored slightly higher than the national and previous Utah samples in most of the content categories. For the

Exhibit 4

**Utah vs. National Percent of
Correct Responses for CTBS Mathematics Test
by Content Category, Grade 5**

CONTENT AREA	PERCENT OF CORRECT RESPONSES			
	UTAH 1975	UTAH 1978	UTAH 1981	NAT'L NORM
MATHEMATICS COMPUTATION - OPERATIONS				
<u>Addition</u> (1, 2, 3, & 4 digit, column, like fractions, etc.)	77%	78%	79%	75%
<u>Subtraction</u> (mixed number, whole number, like fractions, decimal numbers, etc.)	74%	75%	76%	72%
<u>Multiplication</u> (2, 3, & 4 digit, proper fractions, etc.)	67%	68%	69%	63%
<u>Division</u> (no remainders, money, whole number by fraction, decimal numbers, etc.)	58%	56%	57%	50%
MATHEMATICS CONCEPTS AND APPLICATIONS				
<u>Number Systems/Properties</u> (equivalent forms, factoring, reciprocals, etc.)	65%	65%	66%	61%
<u>Sets</u> (union, intersection, number property, fractional property, etc.)	63%	64%	65%	63%
<u>Geometric Relationships</u> (curves, angles, planes, measure given figures, etc.)	63%	64%	66%	63%
<u>Measurement</u> (convert & compute measures of time, length, money, liquid, weight, etc.)	61%	62%	62%	57%
<u>Mathematical Sentences</u> (solve for an unknown in equations and mathematical sentences)	61%	62%	59%	60%
<u>Graphs</u> (interpret information on a circle or line graph)	68%	70%	74%	66%
<u>Problem Solving and Reasoning</u> (missing terms in a sequence, needed information, etc.)	62%	63%	63%	59%

Mathematics Computation-Operations areas, the 1981 Utah results were consistently higher than those of the national standardization sample on all four content categories (Addition, Subtraction, Multiplication, and Division). In 1975, 58% of the division questions were answered correctly by Utah students, compared to 57% in 1981. This was the only computation content area where there was a decline from 1975 to 1981.

On Mathematics Concepts and Applications, the Utah students performed at generally higher levels in 1981 than in 1978, with the Utah samples being typically higher than the national norming sample. However, Utah students in 1981 gave correct answers to 59% of the items in the Mathematical Sentences category, compared to 62% in 1978 and 60% in the national norm group. Utah students thus showed declining performance in this content category, and are now below the national norm. The general impression from Exhibit 4 is that the Utah students are improving in mathematics and are significantly higher than the norm sample in most areas.

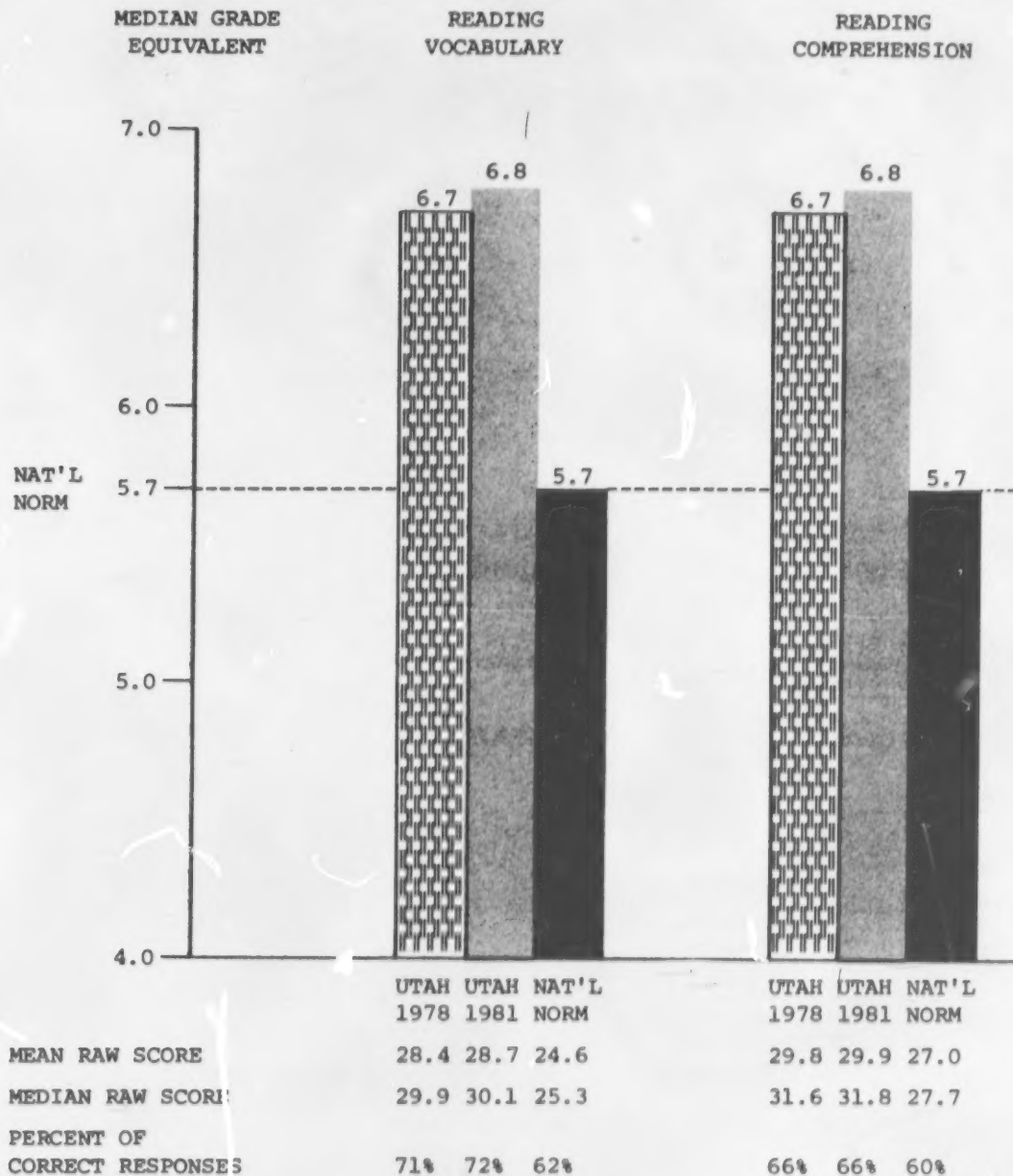
Subscore Results for Reading

In Exhibit 5, the results for the Reading Vocabulary and Reading Comprehension subscores are presented for the 1978 and 1981 Utah samples and for the national standardization sample. On both subscores, the 1981 Utah sample clearly surpassed the national sample. The results generally speak well for reading programs throughout the state compared to the national average.

Supplemental information about the performance of Utah's 5th grade students is presented at the bottom of the exhibit. In mean raw scores, median raw scores, and percent correct, the Utah students clearly

Exhibit 5

Utah vs. National Results on Comprehensive Tests of Basic Skills Reading Subscores, Grade 5



exceeded the national average.

Results on Specific CTBS Reading Content Areas

Information concerning 5th grade reading performance in specific content categories is presented in Exhibit 6. This information can help clarify areas of strength and weakness in Utah students compared to the national sample. The results, however, revealed a rather uniform pattern of superior performance for the 1981 Utah sample. The area of greatest strength over the national sample was Reading Vocabulary, while Literal Recall and Conclusions were the areas in which Utah students had somewhat less of an advantage.

CTBS Results for Grade 11

Total Score Results for Mathematics and Reading

Comparisons among the 1975, 1978, and 1981 Utah 11th grade samples and the national standardization sample on CTBS Mathematics Total are presented in Exhibit 7. Also presented are the results for Reading on the 1978 and 1981 Utah samples and the national standardization sample.

For the Mathematics Total score, there was a substantial improvement from 1978 to 1981. Over that time period, the median grade equivalent increased from 11.8 to 12.9; looking at median raw scores, a typical student in the 1981 sample correctly answered an average of about five more items than did a typical student in the 1978 sample, a marked increase in the performance of Utah students. The decline in scores from 1975 to 1978 was only temporary, and in fact the 1981 scores clearly exceeded the 1975 scores. The improvement in 1981 could have

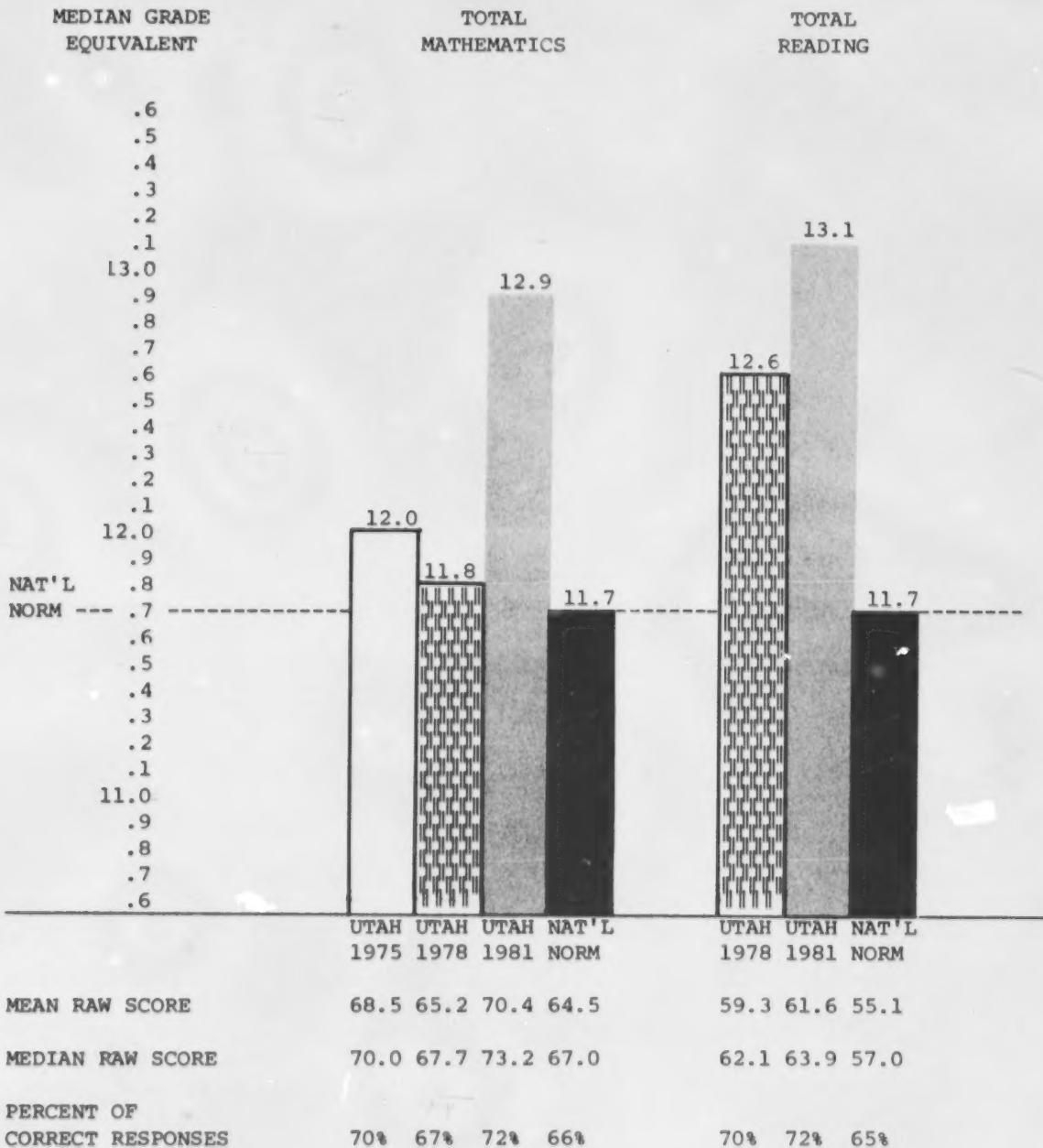
Exhibit 6

**Utah vs. National Percent of
Correct Responses for CTBS Reading Test
by Content Category, Grade 5**

CONTENT AREA	PERCENT OF CORRECT RESPONSES		
	UTAH 1978	UTAH 1981	NAT'L NORM
READING VOCABULARY			
<u>Recall of Synonym</u> (synonym of a particular word in a phrase)	71%	72%	62%
READING COMPREHENSION			
<u>Literal Recall</u> (who, what, where, when questions about facts contained in a passage)	76%	75%	70%
<u>Rewording</u> (answer questions by choosing paraphrased or reworded material)	68%	68%	60%
<u>Context Clues</u> (word meaning from context)	74%	75%	67%
<u>Main Idea</u> (identify author's topic or purpose, summarize central thought or moral, select best title)	63%	63%	57%
<u>Descriptive Words</u> (describe physical attributes, emotions, or qualities of things or people presented in a passage)	60%	60%	54%
<u>Conclusions</u> (cause-effect relationships, conclusions based on stated or implied facts)	61%	61%	56%
<u>Structure/Style</u> (punctuation, function words, tense; identify figurative language, interpret symbols, understand method of conveying viewpoint)	61%	62%	56%

Exhibit 7

Utah vs. National Results on Comprehensive Tests of Basic Skills Mathematics and Reading Total Scores, Grade 11



resulted from the introduction of statewide minimal competency requirements in computation for graduation which were scheduled for implementation for the graduating class of 1980.

The Reading Total scores shown in Exhibit 7, like the Mathematics Total scores, also improved from 1978 to 1981. The median grade equivalent score increased from 12.6 to 13.1, as a typical student in the 1981 sample correctly answered about two more items than did a typical student in the 1978 sample and seven more items than a typical student in the national norm group.

Exhibits 8 and 9 present the Utah 1978 and 1981 11th grade distributions of CTBS Mathematics Total scores and Reading Total scores, respectively. These exhibits demonstrate that the gains in Mathematics and Reading were general across all ranges of performance, rather than being limited only to the high end or the low end. For example, overall gains in Mathematics Total scores from 1978 to 1981 could potentially have been a result of fewer students with low scores, more students with average scores, and no change in the number of students with high scores. Instead, Exhibit 8 shows that achievement is better in all ranges in 1981 compared to 1978. That is, the percentage of students answering only about 30% of the CTBS Mathematics questions correctly (and therefore having grade equivalent scores of about 5.6) was only 4% in 1981, compared to 7% in 1978, indicating that there were fewer students in the lower ranges of mathematics achievement. At the same time, the percentage of students answering about 90% of the questions correctly (and therefore having grade equivalent scores of 13.6) was 23% in 1981, compared to 16% in 1978, indicating that there were also more

Exhibit 8

**Distribution of Scores on CTBS
Mathematics Total, Grade 11**

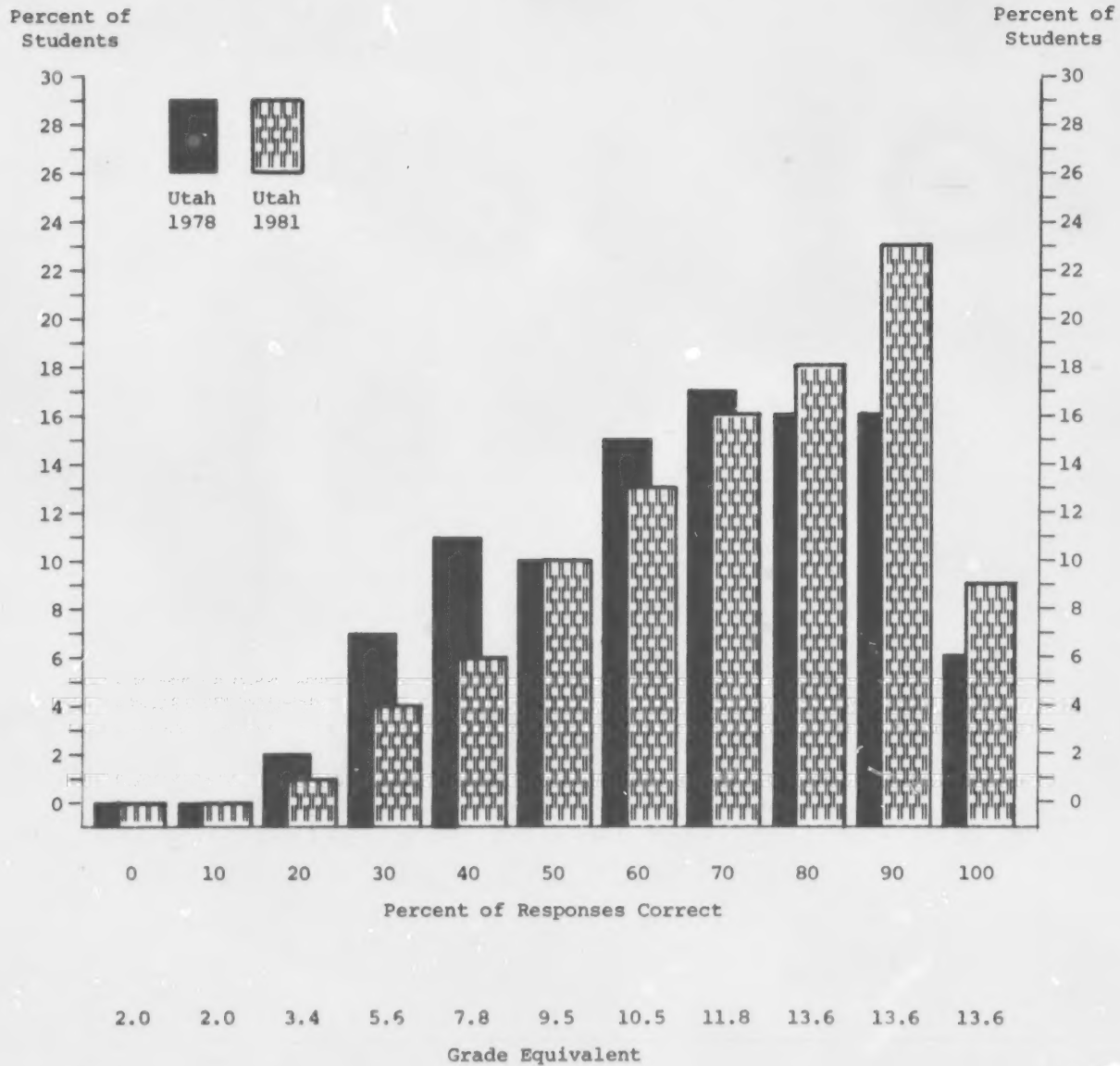
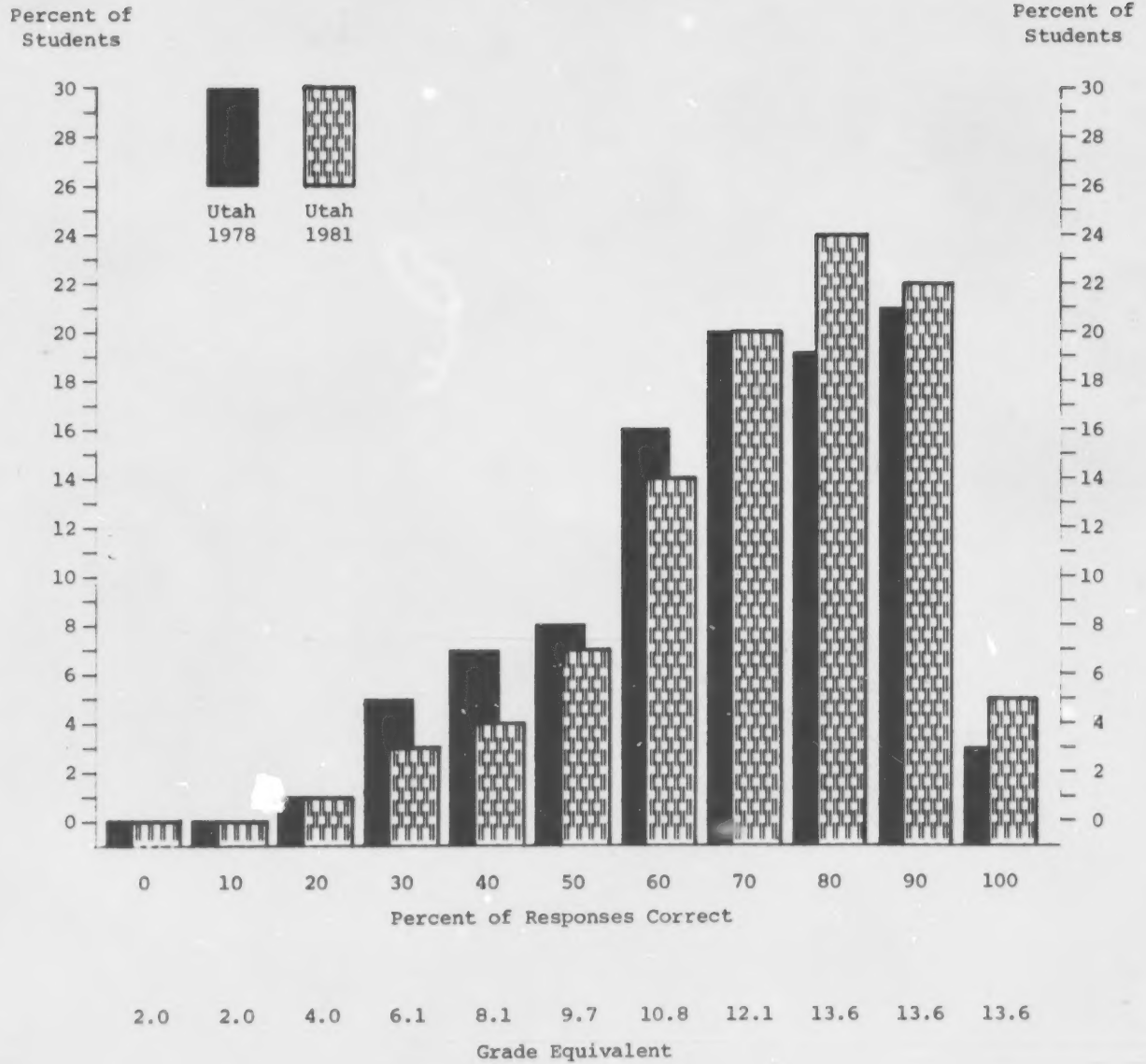


Exhibit 9

Distribution of Scores on CTBS Reading Total, Grade 11



students in the higher ranges of mathematics achievement. Exhibit 9 shows a similar pattern for Reading Total scores from 1978 to 1981: fewer students with low scores, more students with high scores. Exhibits 8 and 9 clearly show the skewness in the CTBS scores, with a majority of scores near the high end of the score distribution and only a relatively few scores near the low end.

For both mathematics and reading, the performance of Utah 11th graders in 1981 was clearly superior to the national norm. In fact, Utah students exceeded the national norm by more than a full grade equivalent for both score areas--a very encouraging finding.

Subscore Results for Mathematics

Information concerning the grade equivalent standings on major subscores of the Utah sample compared to the national standardization sample will not be presented due to problems with grade equivalent scaling at the higher grade levels. However, for the three subscore areas, the 1981 Utah results were higher than the national standardization sample and the results obtained in 1978. The raw score medians for the 1981 Utah sample and the national sample on the subscores were: 38.1 for the Utah sample versus 34.0 for the national sample on Mathematics Computation; 19.0 for the Utah sample versus 17.5 for the national sample on Mathematics Concepts; and 17.9 for the Utah sample versus 14.8 for the national sample on Mathematics Applications. Thus, on each of the subscores, the 1981 Utah sample correctly answered more questions than did the national sample.

Results on Specific CTBS Mathematics Content Categories

The 11th grade results obtained for the specific content areas within the CTBS Mathematics test are presented in Exhibit 10. This exhibit shows the average percentage of correct responses for each of the specific content categories for the Utah samples and the national standardization sample. For most categories, the achievement of the 1981 Utah sample equaled or exceeded that of the 1978 sample and the national sample. Across the Mathematics Computation-Operations sets of items, the 1981 Utah sample answered higher percentages of items correctly than the national standardization sample.

On the item categories within Mathematics Concepts and Applications, the 1981 Utah sample was generally above the standardization sample percentages of correct responses, except on items related to Sets and Geometric Relationships. These two categories, along with the Measurement and Mathematical Sentences categories, were above the 1978 levels, but still below the 1975 levels. The remaining content categories were at or above the 1975 levels. Sets and Geometric Relationships are content categories on which Utah educators could focus.

Subscore Results for Reading

As with the 11th grade subscore results for mathematics, information concerning the grade equivalent standings on the Reading subscores for the Utah sample compared to the national standardization sample will not be presented. However, for both of the subscore areas of Reading Vocabulary and Reading Comprehension, the 1981 results on the Utah students were higher than those obtained on the national sample.

Exhibit 10

Utah vs. National Percent of Correct Responses for CTBS Mathematics Test by Content Category, Grade 11

CONTENT AREA	PERCENT OF CORRECT RESPONSES			
	UTAH 1975	UTAH 1978	UTAH 1981	NAT'L NORM
MATHEMATICS COMPUTATION - OPERATIONS				
<u>Addition</u> (unlike fractions, mixed numbers, algebraic expressions, column, etc.)	77%	72%	78%	72%
<u>Subtraction</u> (products, unlike fractions, mixed numbers, negative integers, etc.)	69%	64%	70%	64%
<u>Multiplication</u> (3 digit, proper fractions, mixed numbers, algebraic expression, etc.)	74%	71%	75%	71%
<u>Division</u> (remainders, fractions, mixed numbers, negative fractions, etc.)	71%	65%	72%	63%
MATHEMATICS CONCEPTS AND APPLICATIONS				
<u>Number Systems/Properties</u> (equivalent forms, factoring, reciprocals, place value, etc.)	71%	71%	72%	61%
<u>Sets</u> (union, intersection, number property, fractional property, separating sets, etc.)	71%	67%	69%	69%
<u>Geometric Relationships</u> (curves, angles, planes, measure given figures, formulas, etc.)	66%	60%	65%	66%
<u>Measurement</u> (convert and compute measures of time, length, money, liquid, weight, etc.)	74%	68%	73%	69%
<u>Mathematical Sentences</u> (solve for an unknown in equations and mathematical sentences)	61%	54%	60%	56%
<u>Problem Solving and Reasoning</u> (missing terms in sequence, needed information, etc.)	70%	65%	70%	64%

The raw score medians on the subscores were: 31.0 for the Utah sample versus 27.3 for the national sample on Reading Vocabulary and 33.0 for the Utah sample versus 30.3 for the national sample on Reading Comprehension. Each of these differences represented about 10% additional correct responses on the Utah sample.

Results on Specific CTBS Reading Content Areas

Information concerning 11th grade reading performance in specific content categories is presented in Exhibit 11. This information can help clarify areas of strength and weakness in Utah students compared to the national sample. However, much like those obtained at the 5th grade, the results revealed a general pattern of superior performance for the Utah sample. The area of greatest strength over the national sample was Rewording. Context Clues and Structure/Style were areas in which the Utah students showed the least advantage over the national sample.

Special 11th Grade Mathematics Analyses

The 1978 declines in 11th grade mathematics achievement prompted special attention to mathematics in the 1981 Assessment. Data were gathered to determine the mathematics courses that high school students had taken, and to measure the differences in achievement scores between students who had taken math and those who had not. In addition, a set of 32 special mathematics items was included in the Assessment battery.

Exhibit 12 shows the percentages of 11th grade students who had taken specific mathematics courses. The math course most commonly taken

Exhibit 11

Utah vs. National Percent of Correct Responses for CTBS Reading Test by Content Category, Grade 11

CONTENT AREA	PERCENT OF CORRECT RESPONSES		
	UTAH 1978	UTAH 1981	NAT'L NORM
READING VOCABULARY			
<u>Recall of Synonym</u> (synonym of a particular word in a phrase)	70%	74%	65%
READING COMPREHENSION			
<u>Literal Recall</u> (who, what, where, when questions about facts contained in a passage)	52%	55%	45%
<u>Rewording</u> (answer questions by choosing paraphrased or reworded material)	73%	76%	65%
<u>Context Clues</u> (word meaning from context)	72%	73%	71%
<u>Main Idea</u> (identify author's topic or purpose, summarize central thought or moral, select best title)	68%	70%	65%
<u>Descriptive Words</u> (describe physical attributes, emotions, or qualities of things or people presented in a passage)	72%	72%	68%
<u>Conclusions</u> (cause-effect relationships, con- clusions based on stated or implied facts)	74%	76%	66%
<u>Structure/Style</u> (punctuation, function words, tense; identify figurative language, interpret symbols, understand method of conveying viewpoint)	66%	67%	64%

Exhibit 12

**Percent of Students Who Have Taken
Specific Mathematics Courses, Grade 11**

<u>MATHEMATICS CLASS</u>	<u>SEX</u>		<u>SCHOOL SIZE</u>			<u>TOTAL</u>
	<u>MALE</u>	<u>FEMALE</u>	<u>SMALL</u>	<u>MEDIUM</u>	<u>LARGE</u>	
Pre-Algebra	54%	59%	34%	48%	62%	57%
First Year Algebra	69%	72%	57%	66%	74%	71%
Second Year Algebra	47%	37%	31%	37%	44%	42%
Geometry	48%	33%	31%	28%	47%	42%
Trigonometry	25%	15%	4%	18%	21%	19%
Pre-Calculus/Calculus	10%	4%	3%	3%	8%	7%

(by 71% of the students tested) was First Year Algebra. A majority (57%) of students had taken Pre-Algebra, whereas only a very small minority (7%) of students had taken Pre-Calculus/Calculus. Although slightly greater percentages of females than males had taken Pre-Algebra and/or First Year Algebra, considerably greater percentages of males had taken more advanced math courses such as Geometry (48% versus 33%) or Second Year Algebra (47% versus 37%). At the same time, much smaller percentages of students in small high schools had taken math courses, compared to students in large high schools. For example, only 34% of the students in small schools had taken Pre-Algebra, compared to 62% in large schools; only 4% in small schools had taken Trigonometry, compared to 21% in large schools. These findings may indicate that small schools offer fewer mathematics courses. The results also raise questions about the nature of career counseling in the small schools. In small schools, are students with mathematics ability encouraged to develop this potential?

These differences in math courses taken were related to performance on the CTBS Mathematics test. For example, the mean Mathematics Total score was 77.0 for students who had taken First Year Algebra, versus 56.3 for students who had not. For students who had taken Geometry, the mean Mathematics Total score was 82.7, compared to a mean score of 62.5 for students who had not taken Geometry. Obviously, students who had taken these math courses had substantially higher levels of math achievement. However, the students who had elected to take these math classes were likely those with greater motivation and aptitude for math. The differences in achievement scores may reflect not just differences

in math class experience but also pre-existing differences in interest and ability.

Exhibit 13 presents results for selected items from the set of special mathematics items. The overall pattern of responding to the special mathematics items indicated that a large majority of 11th grade Utah students had mastered basic mathematical skills. For example, responses to the first item in Exhibit 13 showed that 86% of the students could correctly calculate gas mileage. Students had greater difficulty with the intermediate level mathematics involved in algebra and geometry. For example, the third item shown in Exhibit 13 indicates that only 63% of the students could correctly solve an algebra problem, while the fourth item shows that only 41% knew the definition for the area of a circle. These results are fairly typical of the other special mathematics items. A large percentage of students could correctly answer questions involving very basic math, but a substantially smaller percentage of students could correctly answer questions involving intermediate or higher levels of math, such as geometry or algebra.

The findings from these special mathematics items verify the pattern of results from CTBS and ACT scores in Utah: students perform well in basic mathematics (as measured by CTBS) but are not as well prepared in intermediate or higher-level mathematics areas (as measured by ACT). Utah students are clearly above the national norm on CTBS tests of mathematics (earning a median raw score of 73.2 compared to the national median raw score of 67.0). At the same time, the very latest results (American College Testing Program, 1981) show that Utah students are below the national norm on ACT tests of mathematics (earning an

Exhibit 13

**Results for Selected Special
Mathematics Items, Grade 11**

ITEM	PERCENT OF SAMPLE RESPONDING CORRECTLY
1. Mr. Johnson used 13 gallons of gasoline in driving 208 miles. How many miles to the gallon did he get?	
A. 12 miles per gallon	
B. 15 miles per gallon	
C. 16 miles per gallon -----	86%
D. 18 miles per gallon	
E. Don't know	
2. Julie now has \$482 and will receive a paycheck for \$264 tomorrow. If she buys a \$213 airplane ticket on the following day, how much money will she have left?	
A. \$51	
B. \$269	
C. \$431	
D. \$533 -----	93%
E. Don't know	
3. What value of x will make the following sentence true?	
$3x - 12 = x$	
A. -4	
B. -3	
C. 4	
D. 6 -----	63%
E. Don't know	
4. What is the definition for the area of a circle?	
A. Area = diameter x π	
B. Area = diameter x radius	
C. Area = radius squared x π -----	41%
D. Area = circumference x radius squared	
E. Don't know	

average score of 16.8 compared to the national average score of 17.3). These ACT results reflect differences in the level of mathematics assessed and the fact that Utah has an unusually large percentage of students taking the ACT tests. The conflicting results between ACT and CTBS measures indicate that a careful review of mathematics needs is warranted.

Correlates of Mathematics Achievement

Individual Student Level of Analysis

Since the total scores obtained on Mathematics and Reading were highly related, only the relationships of the Mathematics Total score with other variables will be presented. Generally, because of the high relationship between the Mathematics and Reading scores, other measures related to Mathematics would also be related to Reading with few, if any, real differences. This section will present only the results obtained on individual students, and, because of the similarity of the 5th and 11th grade results, the presentation will apply to both grades, with any differences noted. This information on the correlates of mathematics achievement can help to promote a better understanding of students with various levels of mathematics achievement and to define the relationships among the measures used for each goal area. These results also provide indications of the validity of the various measures.

Students with high performance on the Mathematics Total score also tended to be above average on all the scales from the Emotional Maturity Goal area. The highest relationship with any of the Emotional Maturity

scales was with Academic Self-Concept ($r = .38$ for 5th grade students and $.36$ for 11th grade students). Mathematics achievement was relatively independent of the Social Maturity measures of Peer Relations and Extracurricular Activities. The achievement measures for the Aesthetic Maturity (Music Achievement and Art Achievement) and the Productive Maturity (Economic Awareness and Consumer Competence--11th grade) Goal areas were related to the achievement measures for Intellectual Maturity. These relationships among achievement measures reflect intellectual ability and test-taking skills. Mathematics achievement was also related to Independent Development, and Career Awareness and Exploration (11th grade), although the relationships were weak (r 's about $.20$). Students who scored above average on mathematics were somewhat more inclined to enjoy school and to report that they had superior ability in mathematics.

Relationships with Educational Process Measures--Grade 5

At the 5th grade level, the scores of students within each classroom were averaged to examine the relationships among variables using the classroom as the unit of analysis. For this analysis, the sample was restricted to students who indicated that they had only one teacher. Because the 11th grade students rotated extensively across classes, similar processing was not done at that level.

As a result of the averaging process, individual differences between students within classrooms were no longer present. What remained were the underlying differences in characteristics of student groups (such as the effects of socioeconomic status), differences associated with classroom teaching techniques, and the cumulative

effects of differences between schools. When the classroom means of the achievement measures were correlated with the classroom means on the Educational Process measures, only one of the latter, Expectations, was related to mathematics achievement. Expectations was based on student descriptions of classroom procedures, and the relationship ($r = .21$) was low but indicated that teachers who expected students to do their best, who assigned a lot of hard work, etc., had students with higher levels of mathematics performance than teachers whose expectations were not so high. Explaining differences between classrooms in mathematics achievement as a function of an educational process--Expectations--is an example of a research finding that has been difficult to obtain in many studies. This result certainly warrants further research and consideration by Utah educators.

Demographic Correlates of the Mathematics Total Score

A significant finding, which recurred throughout this study and essentially replicated the findings of the previous Assessments, concerned the importance of socioeconomic status (SES). Students from high income families tended to perform more effectively on mathematics achievement at both grade levels ($r = .37$ at grade 5 and $.36$ at grade 11). These results confirm previous research findings which have indicated the important influence of the home environment for student learning. The results therefore suggest that assistance by the schools to students from low income homes is important in helping these students realize their potential.

The mathematics achievement results showed slight differences in the performance of the racial groups studied at both the 5th and 11th

grade levels. American Indians, Chicanos, and Blacks all tended to score lower than whites. These findings are similar to and possibly related to the results found with SES; whites tend to have a comparatively more advantaged background.

The differences in mathematics ability among 5th grade students in small versus large schools, or rural versus urban schools were trivial. However, at the 11th grade, there were some small but distinct differences. Students from large or suburban high schools tended to have higher mathematics achievement scores than students from small or rural schools. These results could be explained by the effects of SES, but are also compatible with the position that larger, more well-equipped high schools do have some advantages for the students.

Summary

The Mathematics and Reading sections of the Comprehensive Tests of Basic Skills, Form S, were the main measurement instruments for the Intellectual Maturity Goal area. Information was also gathered on high school math class experiences and performance on special math items. The analyses examined the standings of Utah students on these measures and the relationships of the Mathematics Total score with the student outcome measures from other goal areas, the educational process measures, and the demographic characteristics. A summary of the results from measures of the Intellectual Maturity Goal area follows:

- (1) The 5th grade results for mathematics and reading achievement showed that the 1981 Utah sample performed at about the same level as the 1978 sample, and clearly exceeded the performance of the national norm group.

- (2) The 11th grade results for mathematics and reading achievement showed that the 1981 Utah sample performed substantially better than their 1978 counterparts, and also surpassed the national norm group. These improvements may be related to the introduction of minimum competency requirements for graduation. While the performance of Utah 11th grade students in basic mathematics has increased rather dramatically, the special math item results and recent ACT results suggest that Utah students are not as well prepared in intermediate or higher-level mathematics areas such as geometry and algebra.
- (3) Attention to specific content categories in mathematics is warranted at both grade levels, despite the generally high total scores for mathematics. In particular, 5th grade students in Utah showed declining performance in Mathematical Sentences and are now below the national norm in that content category. The 11th grade students remain at or below the national norms for Sets and Geometric Relationships.
- (4) Results from questions about high school mathematics class experiences showed that a majority of 11th graders had taken Pre-Algebra and/or First Year Algebra. A greater percentage of males than females had taken more advanced math courses. Compared to students in large schools, a smaller percentage of students in small high schools had taken advanced math courses. Students who had taken advanced math courses had substantially higher CTBS Mathematics scores than students who had not taken these math courses.
- (5) Students who performed well on the Mathematics and Reading Total scores had higher Academic Self-Concept scores and enjoyed school more.
- (6) The relationship of socioeconomic status with mathematics and reading achievement was significant and could account for much of the relationship found between mathematics and reading achievement and other demographic variables.
- (7) The weight of evidence indicates that teachers who expected greater effort and higher levels of attainment from their students tended to have students with higher levels of mathematics and reading achievement. Educators should continually strive to provide a learning environment that encourages such high levels of student performance.

CHAPTER V

RESULTS FROM THE EMOTIONAL MATURITY GOAL AREA

One's emotional maturity is exemplified by an increasingly constructive management of one's emotions, of coping with stress and frustration, of accepting oneself, and of empathizing with others. (Utah State Board of Education, 1973)

The general objectives listed for achieving this goal included the development of a positive self-image and healthful emotions, obtaining emotional satisfaction, the development of capabilities that bring about personal acceptance in appropriate social groups, understanding the characteristics of mental illness, and other objectives concerned with the general development of high levels of mental health.

Description of Measurement Instruments

In 1975, after a thorough review of available measuring instruments for their compatibility with the Utah Goal of Emotional Maturity, and consideration of their psychometric characteristics, the most effective measurement strategy was to develop a set of new measures which would be appropriate for this goal area at both grades 5 and 11. A thorough pilot study designed to develop these measures was completed by Coray (1975). In that study, many items were analyzed for content and statistical considerations, and the final scales were developed for subsequent use in the Utah Statewide Educational Assessment. The scales for the Emotional Maturity area in the 1981 Assessment consisted of three positive indicators--Academic Self-Concept, Self-Acceptance, and

Autonomy. These scales do not provide comprehensive assessments of all the separate components implied in the statement of this goal; however, taken together, these measures do provide good coverage of key aspects of the emotional maturity of Utah students. More specific descriptions of each of the scales within this goal area are provided below.

The Academic Self-Concept scale measured the students' confidence in their academic abilities by asking them to respond to items describing their ability to learn things quickly, to plan, to persevere, to work independently, to remember, and to think clearly. Students with high scores on this scale reported themselves as self-confident about their academic skills and capabilities. High-scoring students more often reported an outstanding or very good ability to stick with schoolwork until it was finished, to plan and carry out schoolwork, and to do what their teachers wanted them to do. They further reported that they were either outstanding or very good at paying attention to school tasks, thinking clearly under academic pressure, learning quickly, and retaining facts about schoolwork. This scale was most closely associated with the Emotional Maturity objectives of enhancing a positive self-image and developing an accurate insight into one's own capabilities and limitations.

The Self-Acceptance scale measured student self-perception in relation to the school and to the student's peers. High scores on this scale indicated that the students felt good about themselves, were proud of themselves, and were happy about the way they did things. Further, high-scoring students reported that they were well-liked by their friends and probably would not change to be like someone else. This

scale was most closely associated with the Emotional Maturity objectives of developing insights into life's realities, personal acceptance, and understanding the social variations in individuals.

The Autonomy scale measured the amount of independence and self-sufficiency exhibited by the student. High-scoring students indicated their inclination for doing things their own way, working alone, and making independent decisions. Further, they reported that they managed their own lives, were independent workers, were self-directed, and preferred to take care of their own problems. The Autonomy scale was most closely associated with the Emotional Maturity objectives of developing insights into one's own capabilities and limitations, and accepting the consequences of both correct and incorrect decisions.

Results for Emotional Maturity Scales

Results for the Emotional Maturity scales are presented in Exhibit 14 for the 5th grade students and in Exhibit 15 for the 11th grade students. In these exhibits, the percentage of students choosing the two most positive and the two most negative alternatives for the items on each scale are given for 1975, 1978, and 1981. The percentage of students choosing the middle response alternative has been eliminated to simplify the presentation.

At the 5th grade level, there were mixed changes from 1978 to 1981. Over that time period, the percent of positive responses stayed essentially the same for Academic Self-Concept and increased by a moderate amount for Self-Acceptance. However, the percent of positive

Exhibit 14

Emotional Maturity Results, Grade 5

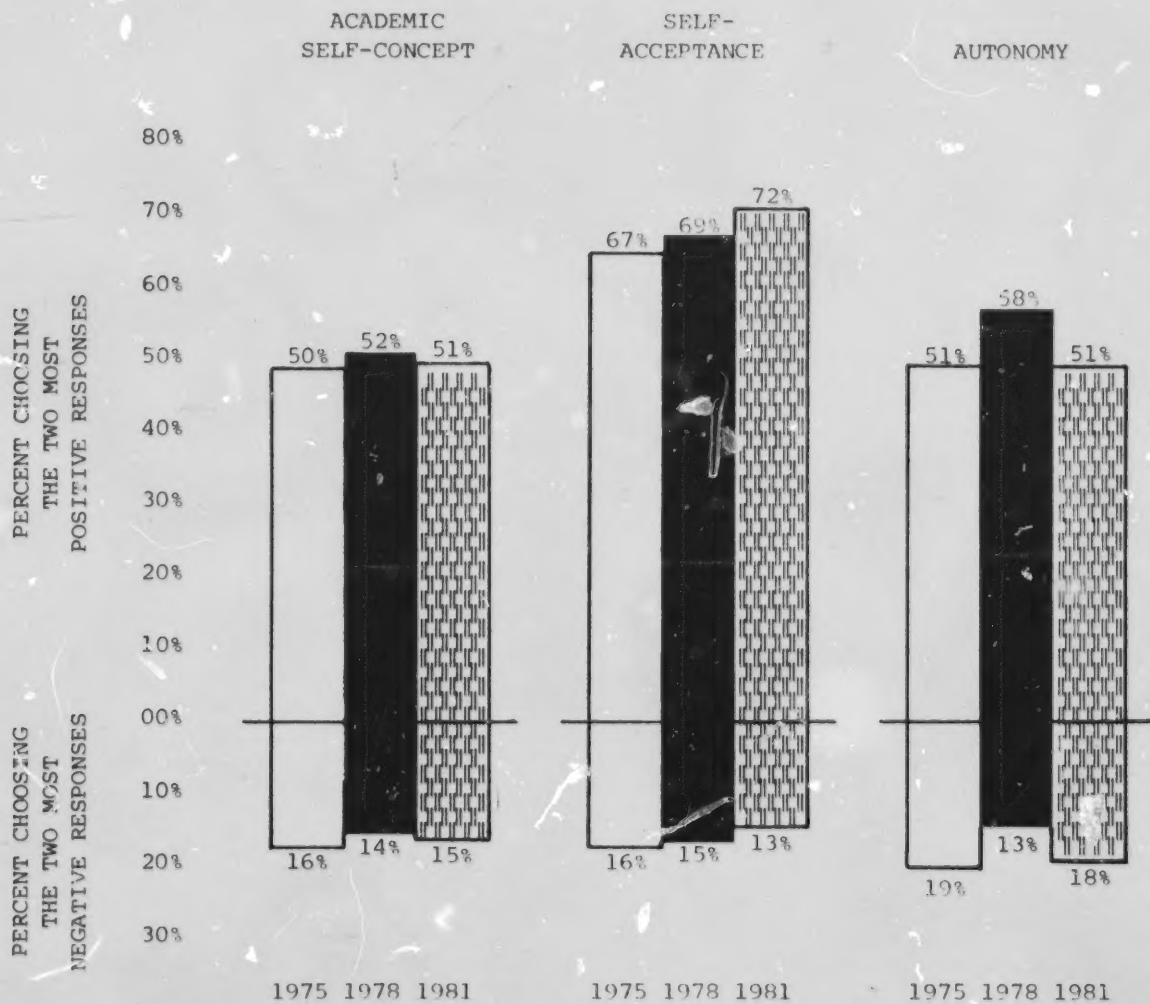
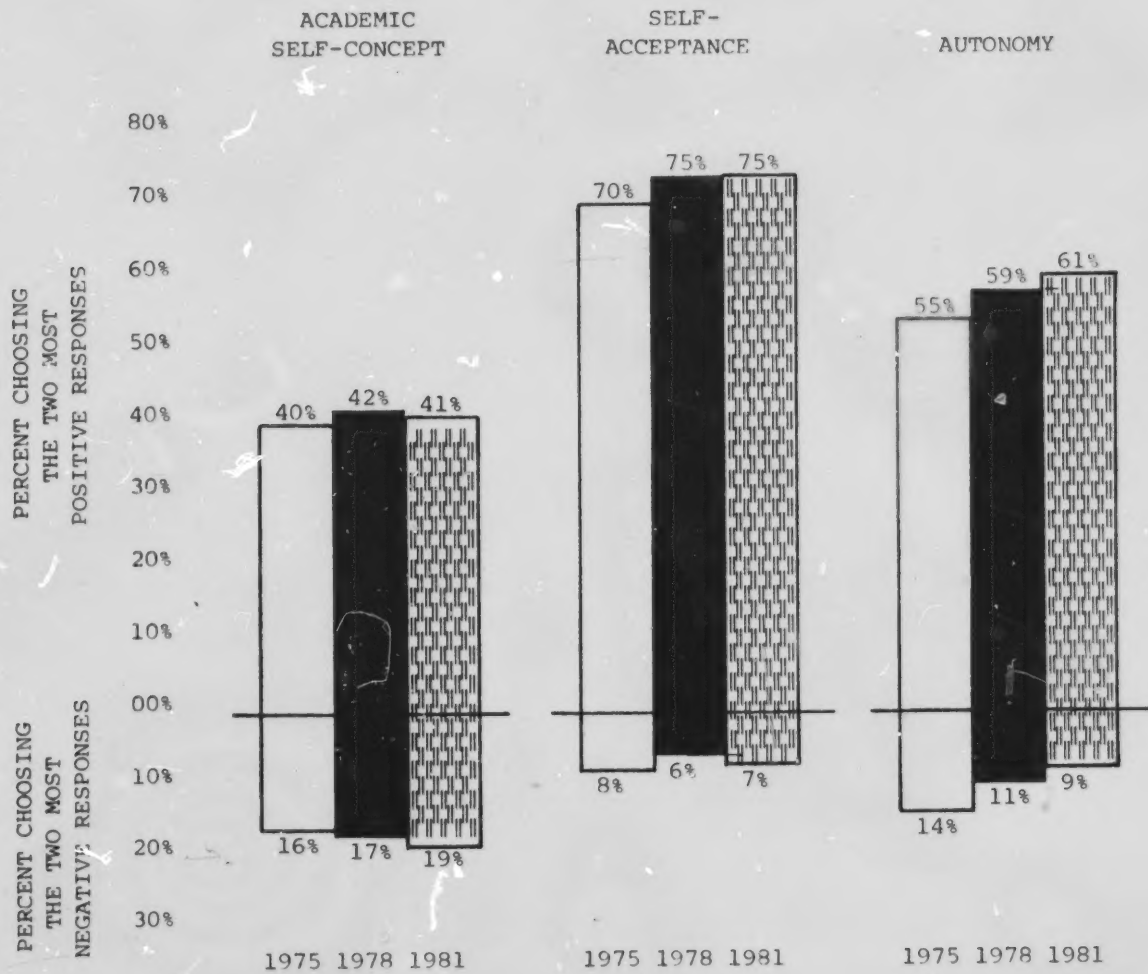


Exhibit 15

Emotional Maturity Results, Grade 11



responses declined for the Autonomy scale, returning to about the same level as in 1975.

At the 11th grade level, the only meaningful change from 1978 to 1981 was represented by a slight increase in positive responses for Autonomy. The percent of positive responses remained virtually unchanged for the Academic Self-Concept and Self-Acceptance scales from 1978 to 1981.

As stated earlier, the research procedures do not permit causal interpretations. The fact that Autonomy scores increased consistently from 1975 to 1981 on the 11th grade students studied suggested a real phenomenon and not an artifact of the samples studied. Perhaps either a cultural movement toward higher levels of self-sufficiency, of "doing one's own thing," or some other factors have been operating to increase the autonomy of Utah's 11th grade students. More troubling is the decline in Autonomy at the 5th grade between 1978 and 1981. Since there was no consistent change in Academic Self-Concept, a score area that is more directly under the schools' control, there appeared to be no reason to suspect that the schools were responsible for movements in the Autonomy score area.

The generally high level of endorsement of positive alternatives indicated a positive level of adjustment of the Utah students on the Emotional Maturity scales. However, students' self-perceptions appear to develop differently on the separate scales, as the students move through the school system. For example, students have lower Academic Self-Concept scores in the 11th grade than they did in the 5th grade; on the other hand, they have higher Autonomy scores than they did in the

5th grade. This may mean that, as students become more self-directed and self-sufficient, they become more aware of their limitations and lose some self-confidence in their academic skills. In any case, there is no automatic tendency for students to feel more positive about themselves as learners as they grow older. This emphasizes the importance of school policies and educational goals which develop success experiences and reduce failure, without lowering standards.

The general level of student endorsement of positive responses should be viewed as encouraging for the Emotional Maturity Goal area and the mental health of Utah students. However, at both grades, there were fairly large numbers of students who endorsed negative alternatives. These results, too, emphasize the importance of teachers and the educational system working with such students trying to prevent the further development of maladaptive tendencies and to promote higher levels of emotional maturity.

Exhibit 16 presents the 1981 results for sample items from the Academic Self-Concept scale. This scale was selected for more detailed discussion, since Academic Self-Concept was most directly concerned with the educational system. This exhibit provides additional evidence of the general emotional maturity of Utah students, as demonstrated by their selection of positive alternatives to the items presented. Items 2 and 4 on this exhibit have a larger percentage of students selecting negative alternatives, suggesting that student planning and perseverance are areas which offer opportunities for improvement at both the 5th and 11th grade levels.

Exhibit 16

Results for Selected Items from the Academic Self-Concept Scale, Grades 5 and 11

ITEM	PERCENT OF STUDENTS CHOOSING EACH ALTERNATIVE	
	GRADE 5	GRADE 11
1. My ability to learn things quickly is:		
A. Outstanding	13%	8%
B. Very good	34%	41%
C. Good	41%	41%
D. A little weak	11%	8%
E. Rather poor	2%	0%
2. My ability to stick with schoolwork until it is finished is:		
A. Outstanding	17%	6%
B. Very good	26%	23%
C. Good	31%	35%
D. A little weak	19%	31%
E. Rather poor	6%	5%
3. My ability to do schoolwork is:		
A. Outstanding	18%	9%
B. Very good	37%	36%
C. Good	35%	41%
D. A little weak	9%	11%
E. Rather poor	2%	3%
4. My ability to plan and carry out my schoolwork is:		
A. Outstanding	13%	6%
B. Very good	31%	25%
C. Good	40%	41%
D. A little weak	14%	25%
E. Rather poor	3%	3%
5. My ability to do what my teachers want me to do is:		
A. Outstanding	23%	11%
B. Very good	37%	37%
C. Good	29%	43%
D. A little weak	8%	8%
E. Rather poor	3%	1%

Correlates of Academic Self-Concept--
Individual Student Level of Analysis

The Academic Self-Concept scale was selected as the key measure for the Emotional Maturity Goal because it was most directly concerned with the impact of the student's educational experience. A presentation of its relationships with other measures included in the study will clarify what was measured by the scales in each goal area.

Since the pattern of relationships for the Academic Self-Concept scale with other measures was essentially the same at both the 5th and 11th grade levels, these results will not be discussed separately by grade. As already mentioned, a person with a high score on this scale had relatively good mental health and confidence in his/her ability to do well in an academic setting. The Academic Self-Concept score had a meaningful pattern of relationships with the other scores in the Emotional Maturity area, as it correlated moderately with Autonomy ($r = .48$ at the 5th grade and $.51$ at the 11th grade) and somewhat less so with Self-Acceptance. These results supported the validity of the measures developed for this goal area.

Students with high scores on Academic Self-Concept tended to be relatively well-rounded individuals since there were positive relationships between the Academic Self-Concept score and key scales from other goal areas. Students who were above average on the Academic Self-Concept score also tended to be above average on the CTBS Mathematics Total score from the Intellectual Maturity area ($r = .38$ at grade 5 and $.36$ at grade 11), and the Peer Relations scale from the Social Maturity area ($r = .57$ at grade 5 and $.45$ at grade 11). There were also moderate positive relationships with Independent Development

from the Productive Maturity Goal area ($r = .42$ at grade 5 and $.44$ at grade 11), with Enjoyment of School ($r = .42$ at grade 5 and $.51$ at grade 11), and with students' self-reported academic achievement measures. This pattern of relationships of Academic Self-Concept with other measures provides additional evidence concerning the importance of a positive self-image in learning skills and competence—Utah's teachers need to continue to develop learning experiences which provide positive recognition of individual student contributions.

Correlates of Academic Self-Concept--
Grade 5--Classroom Level of Analysis

At the 5th grade level, the data were analyzed by correlating the average classroom scores across all measures. The interrelationships of these mean scores generally parallel those obtained with individuals, with some slightly higher relationships as error was averaged out and the individual differences were removed. Analysis at this level permitted examination of the relationships of the process measures with Academic Self-Concept. Of the educational process measures, Reinforcement of Self-Concept, Development of Career Talents, and Classroom Participation all had statistically significant positive relationships with this key performance measure ($r = .43, .31, \text{ and } .24$, respectively). That is, students tended to have above average levels of Academic Self-Concept if they were in classes where good performances were recognized, where students received training in skills which had broader application than immediate academic content, and where students were encouraged to participate.

Academic Self-Concept--Demographic Correlates

Students who were above average on Academic Self-Concept also tended to come from above average income homes as indicated by the positive relationship ($r = .32$ at grade 5 and $.34$ at grade 11) with the socioeconomic status measure. This suggests that the schools have real opportunities to help low income students reach their potential. As might be expected on the basis of these results, whites tended to be slightly higher on Academic Self-Concept.

Summary

Measures used for the Emotional Maturity Goal area in 1981 included three scales--Academic Self-Concept, Self-Acceptance, and Autonomy. The results from the Emotional Maturity Goal area included the following:

- (1) Utah students showed generally positive adjustment across the scales used to measure emotional maturity.
- (2) The 5th grade 1981 results, compared to the 1978 results, showed a moderate increase for Self-Acceptance, no real change for Academic Self-Concept, and a decline for Autonomy. The 1981 Autonomy scores approximated the results obtained in 1975.
- (3) The 11th grade 1981 results, compared to the 1978 results, showed a generally stable pattern, with only slight increases in Autonomy.
- (4) The 11th grade students reported less positive attitudes than the 5th grade students on the Academic Self-Concept scale, but more positive attitudes on the Autonomy scale.
- (5) Students who were above average on the Emotional Maturity measures were above average on academic achievement, on being socially capable, and on being self-starting learners. They also enjoyed school more. These are very positive traits and provide further evidence that emotional maturity should be carefully fostered by the

school system.

- (6) Students from lower socioeconomic status backgrounds tended to have lower emotional maturity scores, suggesting that the schools, where possible, should try to provide an environment where positive growth can occur for these students and for any others having difficulties in the Emotional Maturity area.
- (7) Higher mean scores on the Emotional Maturity measures were found in classrooms where the students reported higher scores on the educational process measures, especially Reinforcement of Self-Concept, Development of Career Talents, and Classroom Participation.

CHAPTER VI

RESULTS FOR THE SOCIAL MATURITY GOAL AREA

A person's social maturity is exemplified by increasingly exercising freedom with its accruing responsibilities; demonstrating functional leadership and appropriate followership; interacting in the social environment for self-realization and/or an awareness of the needs and values of others; acting within the basic values, institutions, and processes of American democracy; understanding world interdependence and how diverse cultures function. (Utah State Board of Education, 1973)

The general objectives for attaining the Social Maturity Goal were concerned with the individual's feelings of personal worth, recognition of the worth of others, commitment to group ideals, assumption of functional leadership roles when needed, acceptance of social responsibility, cooperation in the interest of peace and welfare, and other issues concerned with social behavior and life enrichment.

Description of the Measurement Instruments

Whereas achievement of these general objectives is important for the maintenance of an effective and humane society, assessing the degree to which the objectives have been met with short measuring instruments is quite difficult. Rather than attempt to measure each of the Social Maturity objectives, the 1981 Utah Statewide Educational Assessment effort in this area was directed at the measurement of Peer Relations and Extracurricular Activities. These measures were also used in the 1975 and 1978 studies. Given the time constraints and the appropriateness of available measures, the Peer Relations scale was used

at both the 5th and 11th grade levels. Extracurricular Activities were measured at the 11th grade only. In the construction of these scales in 1975, most of the items were selected from previously constructed measures which had demonstrated stable and meaningful results in past IBRIC studies. The items were adapted and rewritten to fit the needs of Statewide Assessment. While these measures were not intended to be comprehensive, they adequately indicated an individual's level of Social Maturity.

The Peer Relations scale measured the student's level of interpersonal skills, including cooperative skills, ability to help others solve problems and accomplish tasks, and ability to take responsibility. High-scoring students on this scale were more likely to report that they were outstanding or very good at getting others to understand their feelings, working with other students to complete a task, making friends with new students, sharing ideas and feelings with close friends, talking with persons of the opposite sex, and helping someone who is angry or upset to calm down and relax. Further, they were more likely to report that they were outstanding or very good at working with other students as part of a team effort, understanding how other students feel about things, asking problem-solving questions, helping others, getting others to see the humor in things, aiding students who have been absent to catch up, helping their friends to get along with each other, making introductions, and making their friends enjoy visits to their homes.

At the 11th grade level, the second measure for the Social Maturity Goal area was the Extracurricular Activities scale which measured the

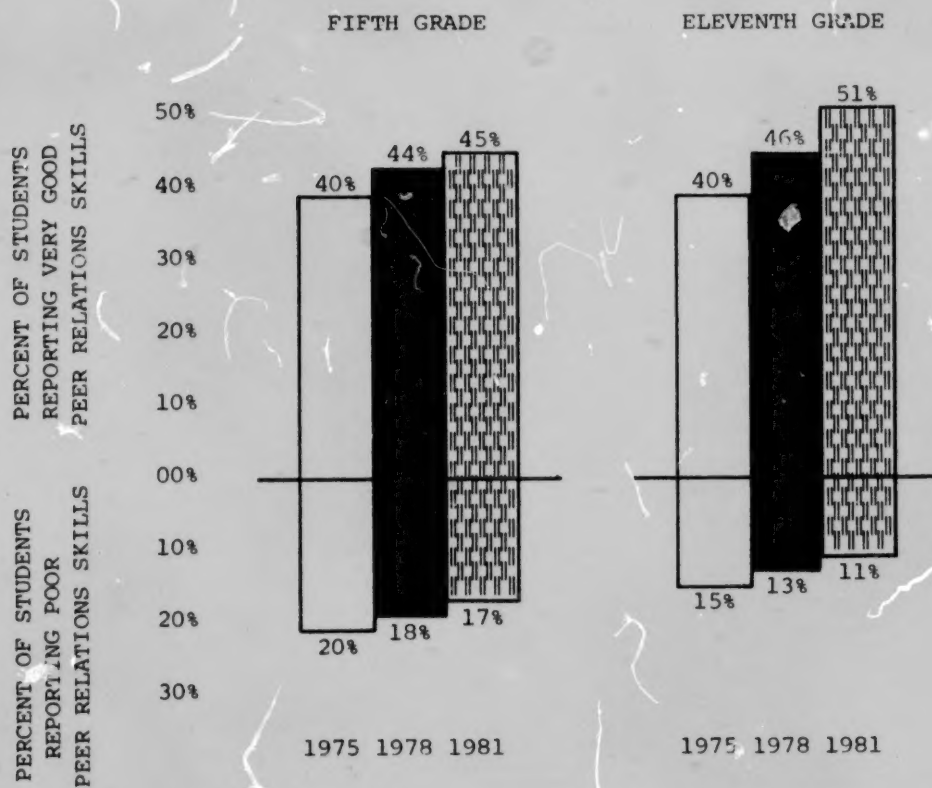
student's level of involvement in school-related activities outside of classwork. Students who scored high on this scale responded that they frequently participated in activities such as journalism, music, art, drama or dance, and were involved in organizations related to business, politics, school, and sport support.

Results for the Peer Relations Scale

Since the Peer Relations scale was prepared specifically for the 1975 Statewide Assessment, no national norms were available; however, 1981 results can be compared to the results obtained previously. The results for the Peer Relations scale for 5th and 11th grade students are presented in Exhibit 17. This exhibit shows the percentage of students choosing the two most positive and the two most negative responses for the items in the scale. In 1981, an average of 45% of the 5th grade students and 51% of the 11th grade students chose "very good" or "outstanding" in responding to the questions in this score area. Only 17% and 11% of the 5th and 11th grade students respectively chose "a little weak" or "poor" in responding to these questions. From 1978 to 1981, there was some slight improvement in the 5th grade Peer Relations scores and more marked improvement in the 11th grade scores. Considering the pattern of growth from 1975 to 1981 and the generally positive results in how students describe their social skills, these findings indicate an increasingly effective level of development for Utah's students in this goal area. In 1981, the 11th grade students scored higher than 5th grade students, a finding that was not evident in 1975, suggesting that maturation and education over the years have

Exhibit 17

**Results from the Peer Relations Scale,
Grades 5 and 11**



resulted in higher levels of performance in the Peer Relations area. These results demonstrate a clear change in the level of social skills that has occurred since 1975.

A sample of items from the Peer Relations scale and the percentage choosing each alternative are presented in Exhibit 18. Examination of these results and those shown previously indicates that the 5th and 11th grade students show some small differences in responding to Peer Relations items. The students' responses to these and other items indicated a generally adequate or effective level of functioning. While these overall results are encouraging, about one in seven of the students studied endorsed alternatives on Peer Relations which indicated that they were either a little weak or rather poor in the Peer Relations skills. Thus, there are still real opportunities for improvement of these skills for some Utah students.

Results for the Extracurricular Activities Scale-Grade 11

Comparisons of results for the Extracurricular Activities scale for 1975, 1978, and 1981 are presented in Exhibit 19. In this exhibit, "at least some participation" is contrasted with "no participation" in a variety of school activities. There was no real change from 1978 to 1981 in the average percentage of students who did not participate in the extracurricular activities surveyed; the percentage in 1978 was 61 while in 1981 the percentage who did not participate was 59. About 60% of the students continued to report no involvement in the extracurricular activities sampled. These results contrast poorly with the 1975 nonparticipation rate of 50%.

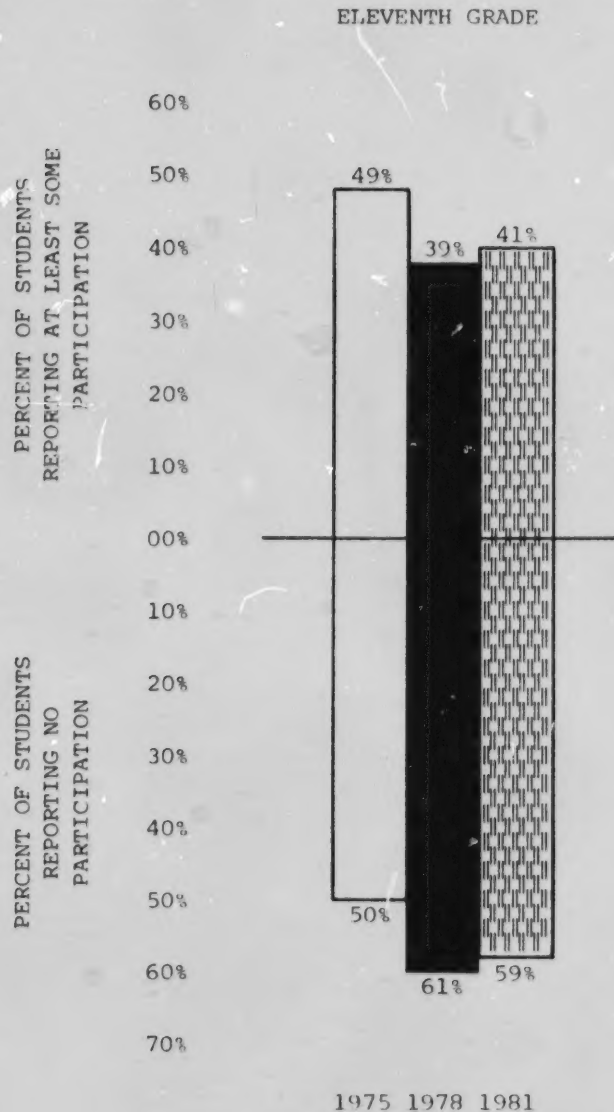
Exhibit 18

Results for Selected Items from the Peer Relations Scale, Grades 5 and 11

ITEM	PERCENT OF STUDENTS CHOOSING EACH ALTERNATIVE	
	GRADE 5	GRADE 11
HOW GOOD ARE YOU AT:		
1. Sharing your ideas or feelings with close friends?		
A. Outstanding	24%	30%
B. Very good	34%	41%
C. Good	30%	21%
D. A little weak	9%	7%
E. Rather poor	3%	1%
2. Working with other students as part of a team effort?		
A. Outstanding	23%	16%
B. Very good	34%	42%
C. Good	33%	35%
D. A little weak	7%	5%
E. Rather poor	2%	1%
3. Helping your friends to get along with each other?		
A. Outstanding	12%	8%
B. Very good	28%	38%
C. Good	42%	42%
D. A little weak	14%	10%
E. Rather poor	4%	1%
4. Helping someone who is angry and upset calm down and relax?		
A. Outstanding	13%	15%
B. Very good	27%	37%
C. Good	39%	39%
D. A little weak	15%	9%
E. Rather poor	6%	1%

Exhibit 19

**Results from the Extra-Curricular
Activities Scale, Grade 11**



Results for 11th grade students on sample items of the Extracurricular Activities scale are presented in Exhibit 20. The item results illustrate the relatively low levels of involvement by most students in the school-associated, extracurricular activities sampled in the questionnaire. On a few items, the shifts in participation from 1975 to 1981 were rather dramatic (e.g., in 1975, 56% of the sample did not participate in some form of political activities; in 1978, 72% did not participate).

Differences in participation rates between males and females were sometimes quite large. Using interscholastic or intramural athletics as an example, only about 20% of the males had no participation, compared to about 40% of the females. For extracurricular music activities, 49% of the females took part, compared to only 32% of the males. For extracurricular drama or dance, 63% of the females had some involvement compared to only 27% of the males. As a general rule, males had substantially higher participation rates in athletic activities whereas females had substantially higher participation rates in non-athletic activities.

As in 1975 and 1978, the relationship between Extracurricular Activities and school size was relevant; average Extracurricular Activities tended to be somewhat lower in larger schools than in smaller schools. Several plausible explanations for the phenomenon could be proposed. One is that small schools are more typically located in rural areas where extracurricular activities tend to center around the school; whereas, large schools are usually located in cities where a greater number of activities--not necessarily centered around the school--are

Exhibit 20

Results for Selected Items from the Extra-Curricular Activities Scale, Grade 11

ITEM	PERCENT OF STUDENTS CHOOSING EACH ALTERNATIVE		
	1975	1978	1981
HOW OFTEN DO YOU PARTICIPATE IN:			
1. Journalism (newspaper, yearbook, literary publications)?			
A. Very often (almost every day)	6%	6%	9%
B. Quite often (about once a week)	4%	2%	2%
C. Somewhat often (about once a month)	8%	6%	6%
D. Not very often (once a term or less)	23%	15%	16%
E. Do not participate	57%	71%	67%
2. Music (band, choir, orchestra)?			
A. Very often (almost every day)	24%	18%	24%
B. Quite often (about once a week)	6%	3%	4%
C. Somewhat often (about once a month)	7%	5%	5%
D. Not very often (once a term or less)	12%	8%	8%
E. Do not participate	49%	66%	59%
3. Drama or dance?			
A. Very often (almost every day)	14%	16%	14%
B. Quite often (about once a week)	8%	6%	8%
C. Somewhat often (about once a month)	13%	9%	8%
D. Not very often (once a term or less)	18%	12%	14%
E. Do not participate	47%	57%	56%
4. Business activities (DECA, Marketing Club)?			
A. Very often (almost every day)	7%	11%	9%
B. Quite often (about once a week)	5%	5%	4%
C. Somewhat often (about once a month)	9%	7%	8%
D. Not very often (once a term or less)	17%	10%	12%
E. Do not participate	62%	67%	67%
5. Political activities (student government)?			
A. Very often (almost every day)	3%	5%	4%
B. Quite often (about once a week)	5%	4%	3%
C. Somewhat often (about once a month)	11%	8%	7%
D. Not very often (once a term or less)	23%	12%	14%
E. Do not participate	56%	72%	72%

available for student participation. Another factor could be that smaller schools tend to have many of the same functions and organizations as do large schools, with less competition for these activities and, thus, have a higher percentage of students involved. A third factor could be that school populations in Utah have been growing since 1975, and this could have contributed to the results obtained.

Correlates of Peer Relations--
Individual Student Level of Analysis

The pattern of relationships between Peer Relations and the other measures studied was quite similar for the 5th and 11th grade students. The relationships of CTBS scores with Peer Relations were relatively low, indicating that student performance in reading and mathematics has little or nothing to do with Peer Relations. However, the relationships between Peer Relations and the various Emotional Maturity scales were moderate to high (r 's about .50 with Academic Self-Concept), indicating that the students who scored high in Peer Relations were likely to score high on the Emotional Maturity measures of Academic Self-Concept, Self-Acceptance, and Autonomy. Peer Relations had low positive relationships (r 's in the .20s) with the Aesthetic Maturity measures indicating that a student who was high on Peer Relations tended to be more aesthetically mature.

The Independent Development scale for the Productive Maturity Goal was related to Peer Relations at a moderate level ($r = .50$ at grade 5 and $.37$ at grade 11), indicating that the student who scored high in Peer Relations was more inclined to participate in self-initiated learning activities than those who scored low.

Peer Relations had generally mixed relationships with several other key measures, e.g., students who were below average in Peer Relations were less inclined to enjoy school, and they reported that they were less likely to continue their education. They also viewed themselves as less capable in reading and mathematics, although, as stated previously, they were approximately average in these skills as measured by the achievement measures.

Relationships with Educational Process Measures

High classroom average scores on Peer Relations were associated with higher scores on the educational process measures of Reinforcement of Self-Concept ($r = .46$), Classroom Participation ($r = .32$), and Development of Career Talents ($r = .38$). These relationships indicated that classrooms with extensive student involvement and participation, positive feedback, and talent activities were more likely to have high mean scores on Peer Relations, suggesting that wider use of these teaching strategies should be considered by Utah educators.

Demographic Correlates of Peer Relations

The Peer Relations scale generally had limited relationships with the demographic measures. It had low positive relationships (r 's about .25 at each grade level) with the SES measures, i.e., 5th and 11th grade students from homes with below average incomes tended to have somewhat lower social skills. Students from rural or small schools also had a slight tendency to have lower social skills. At the 11th grade, there

was a greater tendency for males rather than females to report that their social skills could be improved.

Summary

Two scales measured aspects of the Social Maturity Goal. One of these, Peer Relations, was administered to both 5th and 11th grade students. This scale measured the individual's self-reported ability to interact effectively with other students. An Extracurricular Activities scale was administered only to the 11th grade students. The following summarizes the results from the measures of this goal area.

- (1) Overall, the results indicated an effective level of development in social skills for most Utah students.
- (2) The 5th grade 1981 results showed some slight improvement in social maturity compared to 1978.
- (3) The 11th grade 1981 results showed moderate improvement in Peer Relations compared to 1978 and marked improvement since 1975. No meaningful change occurred in Extracurricular Activities. About 60% of the students continued to report no involvement in the extracurricular activities sampled, with small schools having higher levels of involvement than large schools. Sex differences were apparent: fewer females than males participated in athletics, while more females than males participated in non-athletic activities.
- (4) Students who scored high on Social Maturity scales also scored high on measures of Emotional Maturity, Productive Maturity, and Enjoyment of School.
- (5) Students from lower socioeconomic status backgrounds tended to have lower scores for Peer Relations, while 11th grade males tended to have lower scores for both scales in the Social Maturity area.
- (6) All of the instructional strategies measured by the Educational Process scales were associated with high scores for Peer Relations. Reinforcement of Self-Concept and Development of Career Talents were the two

instructional strategies most strongly related to Peer Relations.

CHAPTER VII

RESULTS FROM THE AESTHETIC MATURITY GOAL AREA

One's aesthetic maturity is exemplified by an increasing sensitivity in perceiving the environment and acknowledging the human qualities of each individual; by a more satisfying use of one's senses in making aesthetic judgment; by more capably communicating aesthetic insights through the cultural arts; and through a greater harmony with oneself. (Utah State Board of Education, 1973)

An assumption which underlies this goal area is that knowledge and appreciation of aesthetics permeate all other facets of an individual's life and allow that person to become more complete, to reach more closely one's true potential. The measurement of student characteristics in this goal area represented a difficult challenge for the assessment staff, as is described in this section.

Description of Measurement Instruments

After an extensive review of available instruments and discussions with subject matter specialists, three specially developed scales were constructed in 1975 to measure different aspects of the Aesthetic Maturity Goal area. A key measure of this goal area which was retained for the 1981 Assessment was the Music Achievement scale, which was based on 21 items. Nine of the items were concerned with a general knowledge of music, while the remaining 12 items in the Music Achievement scale asked for more specific knowledge involving the reading of sheet music. In each test booklet, a page of sheet music for the song "Soldier, Soldier" was reproduced. Examples of the questions asked about the

sheet music were: 1) whether the first note was an eighth, quarter, half, or whole note; 2) in which key was the song written; and 3) to choose the list which correctly named the notes in a given portion of the song.

The second measure in the 1981 Aesthetic Maturity Goal area was a revised version of the 1975 Art Achievement scale. The 1975 results indicated a number of changes were warranted, and the 1978 Art Achievement measure, used again in 1981, was built on the basis of this earlier experience. As with Music Achievement, two types of questions were asked on the Art Achievement scale. The first type of question pertained to knowledge of basic and advanced art concepts. Questions were asked such as what type of colors make a shape stand out from its background, or what happens to an object as it gets farther and farther away. The second type of question asked the student to evaluate certain aspects of simple drawings which were reproduced in the test booklet to illustrate basic art concepts, such as horizon line, shadow position, highlighting, etc.

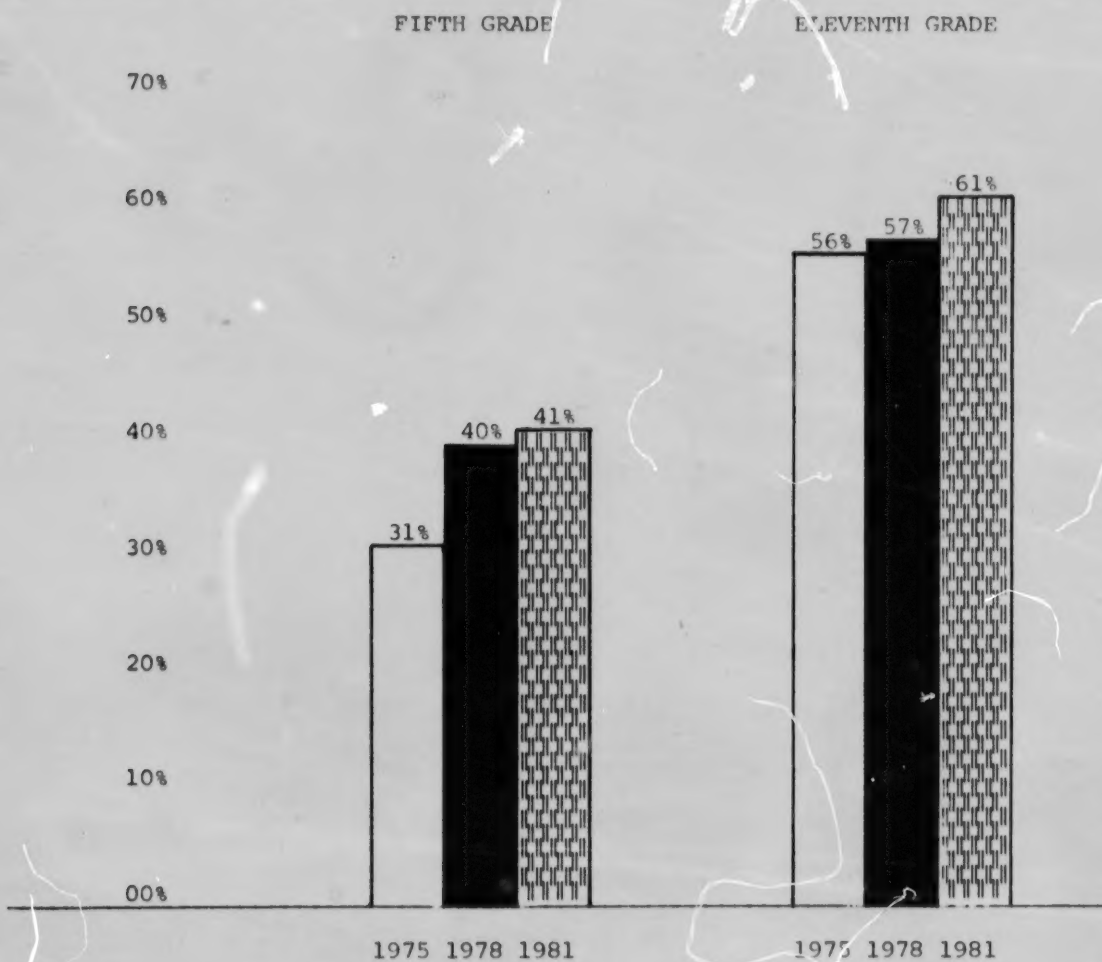
Results for the Music and Art Achievement Scales

Exhibit 21 presents the results for the Music Achievement scale on 5th and 11th grade students. The exhibit shows that 5th grade students in 1981 had scores similar to, or somewhat higher than, the 5th grade students in 1978, with an average of about 41% correct responses on the Music Achievement scale. The large gain that occurred between 1975 and 1978 was thus maintained. These results appear to confirm the continuing impact of the implementation between 1975 and 1978 of a

Exhibit 21

**Results from the Music Achievement Scale,
Grades 5 and 11**

AVERAGE PERCENT OF
CORRECT RESPONSES



statewide elementary music program funded by the State Legislature. Although the program has not been implemented at the secondary school level, the 1981 results for the 11th grade, 61% correct, show a moderate increase from 1978 which could be expected as students move through the system and benefit from a longer and more thorough exposure to the program.

Exhibit 22 presents five example items from the Music Achievement scale and shows the percentage answering correctly for 1981 on 5th and 11th grade students. Items 1 and 3, dealing with music interpretation, generally had a considerably higher percentage of correct responses than did the more difficult music knowledge questions.

Exhibit 23 presents the percentage of correct responses for both 5th and 11th grade students to the Art Achievement scale. Because of revisions to the scale subsequent to the 1975 Assessment, only the 1978 comparisons are relevant. For the 5th grade, Art Achievement improved slightly from 1978 to 1981, even though Exhibit 23 fails (due to the rounding off of scores to the nearest percent) to illustrate the improvement. The small improvement from 1978 to 1981 for the 11th grade is more obvious.

Examples of the results for some specific items from the Art Achievement scale are presented in Exhibit 24. Item 3, dealing with the characteristics of distant objects, was considerably more difficult than the other questions which were of somewhat more uniform difficulty. Overall, 5th grade students correctly answered 43% of the questions on the entire Art Achievement scale, compared to 60% for the 11th grade. These results indicate room for improvement at both grades.

Exhibit 22

Results for Selected Items from the Music Achievement Scale, Grades 5 and 11

ITEM	PERCENT OF SAMPLE RESPONDING CORRECTLY	
	GRADE 5	GRADE 11
1. If you were listening to loud, fast music with drums and cymbals being played, what would you probably feel like doing?		
A. Sitting quietly to listen		
B. Marching or moving with the music -----	71%	84%
C. Swaying gently		
D. Dancing slowly		
E. Don't know		
2. Who composed the Nutcracker Suite (Waltz of the Flowers)?		
A. George Frederick Handel		
B. Peter Ilyich Tchaikovsky -----	27%	44%
C. John Philip Sousa		
D. Sergei Prokofiev		
E. Don't know		
3. Which of the following would you use to suggest the idea of thunder?		
A. Bass -----	50%	71%
B. Baritone		
C. Tenor		
D. Soprano		
E. Don't know		
4. The musical term rit. (or Ritardando) above measure 17* means:		
A. gradually slower. -----	32%	50%
B. gradually faster.		
C. louder.		
D. softer.		
E. Don't know		
5. The musical term mf (Mezzo forte) written above measure 1* means:		
A. medium soft.		
B. medium loud. -----	28%	47%
C. medium slow.		
D. medium fast.		
E. Don't know		

*The sheet music for the song "Soldier, Soldier" was reproduced in the booklets.

Exhibit 23

**Results from the Art Achievement
Scale, Grades 5 and 11**

AVERAGE PERCENT OF
CORRECT RESPONSES

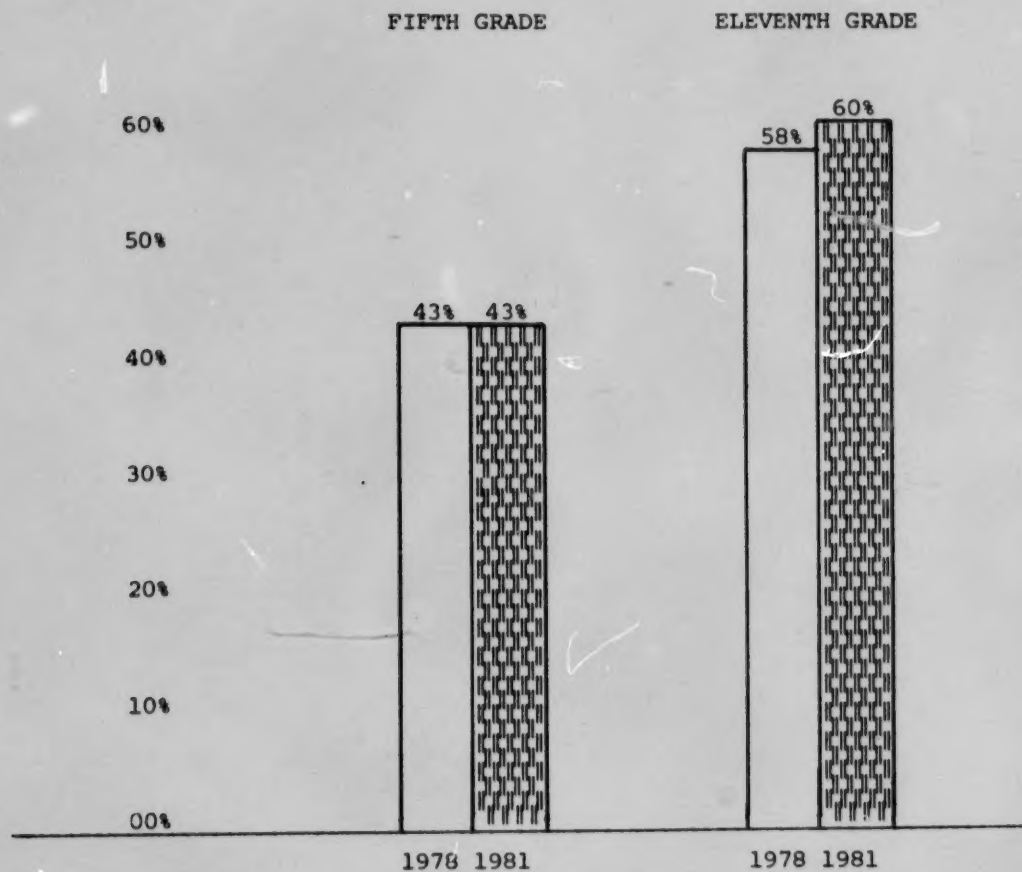


Exhibit 24

Results for Selected Items from the Art Achievement Scale, Grades 5 and 11

ITEM	PERCENT OF SAMPLE RESPONDING CORRECTLY	
	GRADE 5	GRADE 11
1. In drawing or painting a picture, the look of depth is created when people or objects are:		
A. side by side.		
B. on a base line.		
C. in front of one another. -----	42%	65%
2. Most colors you can imagine come from mixing which of the following colors?		
A. Black, white and gray		
B. Red, green and white		
C. Red, yellow and blue -----	52%	74%
D. Yellow, blue and green		
E. Don't know		
3. Which of the following describes the appearance of objects as they get farther and farther away?		
A. More three-dimensional		
B. More hazy, bluish-gray -----	20%	42%
C. Smaller but more detailed		
D. Lower in the picture		
E. Don't know		
4. Which background color would make a bright red stand out most?		
A. Pink		
B. Orange		
C. Light gray -----	43%	62%
D. Don't know		
5. The purpose of a thing influences its shape.		
A. True -----	46%	64%
B. False		
C. Don't know		

Correlates of Music Achievement--
Individual Student Level of Analysis

Primarily because of psychometric characteristics, the Music Achievement scale was selected as the key reporting variable from the Aesthetic Maturity Goal area. These considerations were based on the sensitivity of the measure to individual differences and the meaningful pattern of relationships that was obtained between this scale and the other measures included in the Statewide Assessment battery. In considering these relationships, the Music Achievement scale demonstrated similar patterns on both grades 5 and 11; thus, the results for these two grades will be presented together.

Analysis of the relationships of the Music Achievement scale with other measures included in the battery indicated that students who were above average on Music Achievement also tended to be above average on other achievement measures, including the CTBS Mathematics and Reading scores (r 's in the .40s and .50s) and Art Achievement (r 's of about .45). Since these relationships were only moderately high, they indicate the importance of separate measuring instruments for each of the goal areas. On the other hand, these relationships do provide some evidence of general intellectual skill, perhaps including test-taking ability, as students who were above average on one achievement area also tended to be slightly above average on achievement measures in other goal areas.

The Music Achievement scale had a pattern of low but statistically significant relationships with the various measures of Emotional Maturity. The strongest relationship here was between Music Achievement and Academic Self-Concept ($r = .34$ at grade 5 and $.36$ at grade 11).

These relationships with the Emotional Maturity scales indicated a tendency for students who did well on Music Achievement to have a relatively healthy outlook on themselves and life in general. While no direct statements of causation can be made from these relationships, the results certainly indicate that development of individual potential in the various goal areas is interrelated.

The Music Achievement scale also had a low significant relationship with Peer Relations ($r = .21$ at grade 5 and $.25$ at grade 11). This relationship with the Social Maturity area indicated that students who were high on Music Achievement tended to be respected and enjoyed by their peers.

The Music Achievement scale also had statistically significant relationships ($r = .20$ at grade 5 and $.25$ at grade 11) with the Independent Development scale from the Productive Maturity area, indicating that students who were active in independent learning outside of the school system also tended to be slightly higher in Music Achievement.

Finally, students with high scores on Music Achievement tended to report greater enjoyment of school ($r = .22$ at grade 5 and $.27$ at grade 11).

Relationships with Educational Process Measures

At the classroom level of analysis, the relationships between mean classroom scores on Music Achievement and the other measures were examined. The results typically followed the pattern which has been found at the individual level.

Three of the process measures (Reinforcement of Self-Concept, Expectations, and Classroom Participation) had statistically significant relationships with the Music Achievement scale. This means that, for example, Music Achievement was greater in classrooms where there was more positive feedback and student participation. When higher levels of performance were expected by the teacher, the students did perform at higher levels.

Demographic Correlates of Music Achievement

The correlations of the Music Achievement scale with the demographic variables were important. Relatively high relationships were found between Music Achievement and the Socioeconomic Status measures ($r = .45$ at grade 5 and $.37$ at grade 11). These results indicated that knowledge in the aesthetic area can, at least partially, be explained by the affluence of the student's family. As the goal implies, aesthetic maturity should not be a luxury that can be afforded by only a small portion of the population, but should be an important part of each person's life.

Music Achievement was also related to other demographic variables. For example, whites scored slightly higher on Music Achievement than did other racial groups. Females tended to score higher than males. And students in small or rural high schools tended to score slightly below average.

Summary

This chapter reported the results from the Aesthetic Maturity portion of the Statewide Assessment. The Music Achievement and Art Achievement scales were described, the relationships of the Music Achievement scale with other measures in the project were discussed, as were the classroom and school variables associated with Aesthetic Maturity. The results of this portion of the project included the following:

- (1) The 5th grade results for both Music Achievement and Art Achievement showed that the 1981 students performed at the same level or slightly higher than their 1978 counterparts.
- (2) The 11th grade results for both Music Achievement and Art Achievement showed that the 1981 students performed at somewhat higher levels than did the 1978 students.
- (3) On both Music Achievement and Art Achievement, 11th grade students performed at higher levels than 5th grade students.
- (4) Socioeconomic status played an important role in explaining Music Achievement and Art Achievement. Moreover, females tended to have higher scores than males. Students in small or rural high schools tended to score below average. Steps should be taken to ensure that all students in the state have an adequate opportunity to develop their aesthetic capabilities.
- (5) Students who were above average on Aesthetic Maturity scales reported that they enjoyed school more.
- (6) Expectations, an Educational Process measure, had a significant relationship with both Art and Music Achievement; classes in which students reported they were expected to learn a lot and do their best had higher levels of Art and Music Achievement. Reinforcement of Self-Concept and Classroom Participation were also positively related to Music Achievement.

CHAPTER VIII

RESULTS FROM THE PRODUCTIVE MATURITY GOAL AREA

A person's productive maturity is exemplified by a continuing involvement in the creating, generating, and using of ideas, goods, and services beneficial to humanity and satisfying to the individual. (Utah State Board of Education, 1973)

The general objectives which would lead to the attainment of this goal indicate that the individual should discover, develop, and use his or her full potential in personal, social, and occupational areas.

Description of the Measurement Instruments

Three of the four measures for the Productive Maturity Goal area came directly from the 1975 Statewide Assessment. A fourth scale was devised specifically for the 1978 Assessment.

For both grades 5 and 11, an expanded version of a previously existing measure--Independent Development--was revised and constructed in 1975. Relevant data for the construction of the measure were available from a number of studies completed by IBRIC. The final scale was a measure of the extent to which students independently participate in self-initiated learning activities which increase their general competence. Students with high Independent Development scores reported that they often extended the scope of material learned in school by working on something at home to learn more about it, visited the library to get additional information not needed for classwork, read an advanced text to learn more about a subject, and studied mathematics or science out of school. They also worked on mechanical equipment to learn more

about it, read extensively in different subject matter areas, and worked at developing their writing skills, etc. Because of the general breadth and significance of this scale for the Productive Maturity Goal area, Independent Development was constructed to be appropriate for both 5th and 11th grade students and was the key scale for this goal area.

In addition to this scale, other measures were selected and developed for use at the 11th grade. A scale on Career Awareness and Exploration was included in the 11th grade assessment, with four appropriate items from this area also used for grade 5. This specially developed measure assessed whether students had given some thought to and had some experiences related to career choice. High-scoring students more often reported that they had considered what kinds of training or education were necessary for certain jobs, had made some plans about how much education they wanted after high school, and had made some definite plans about a future career or job. Typically, high-scoring students also indicated that they had taken an interest or ability test and had the results explained to them, had investigated the requirements for an occupation in which they were interested, and had considered what kind of work would provide them an opportunity to use their talents and abilities.

The third measure used at the 11th grade level was Career Development Experience. Three items from this scale were also administered to the 5th grade students. This scale was specially constructed for the 1975 Statewide Assessment and focused on activities and experiences provided by the school, rather than initiated by the individual student. A high score on this scale indicated a high level

of student participation in numerous school activities which examined and evaluated career possibilities during the school year. These activities included: comparing jobs on the basis of training requirements and other considerations; studying how different jobs might influence one's life; preparing a summary of job qualifications; studying how hobbies and spare time interests could be helpful in getting a job; etc.

The fourth and final measure at the 11th grade for the Productive Maturity Goal area was the Economic Awareness and Consumer Competence scale. This cognitive scale was new to the 1978 Statewide Assessment and consisted of items concerning the free market system, unemployment, job characteristics, unit pricing, nutrition, personal finance, etc. The majority of the items in the Economic Awareness and Consumer Competence scale was especially constructed for the 1978 Statewide Assessment, the remaining items were obtained from National Assessment of Educational Progress (1977). Five items from this area were also applicable for the 5th grade. This scale was slightly revised for the 1981 Assessment with a few items being deleted.

Results for the Independent Development Scale

Since the Independent Development scale was prepared specifically for the Statewide Assessment, there were no national norms available against which the Utah sample could be compared. However, extensive information is available concerning the results for the Utah students at each grade level during the 1975, 1978, and 1981 Statewide Assessments, and how this measure related to other variables.

Exhibit 25 shows the percentage of students at both grade levels reporting high and low levels of independent activity for each assessment completed. Differences between grade levels and assessments were minimal. Slightly over one-third of the students reported high levels of independent activity; however, a larger portion (over 40%) reported low levels of participation in these self-initiated learning activities. Approximately two in five students are apparently not motivated toward independent development.

Although the total percentages on Independent Development were similar for grades 5 and 11, there were marked differences in responses to specific items within the scale. Examples of items from the Independent Development scale, along with the percentage of students at each grade level choosing the two most positive alternatives, are presented in Exhibit 26. For most of the items, the percentage of students engaging in the various activities is relatively small. On only a few items is the percentage of students who reported participating in these self-initiated learning activities a few times a week or more over 50%. For example, on the first item, approximately 41% of the Utah 5th grade students studied or worked on something at home just so they could learn more about it a few times a week or more often. At the 11th grade level, the percentage was only 26. For the majority of these items, the 5th grade students were more actively engaged in independent learning activities than were the 11th grade students. On items 4 and 7, which deal with reading magazines and newspapers, the 11th grade students did exceed the 5th grade students in the extent of their participation, as might be expected for these

Exhibit 25

**Results from the
Independent Development Scale,
Grades 5 and 11**

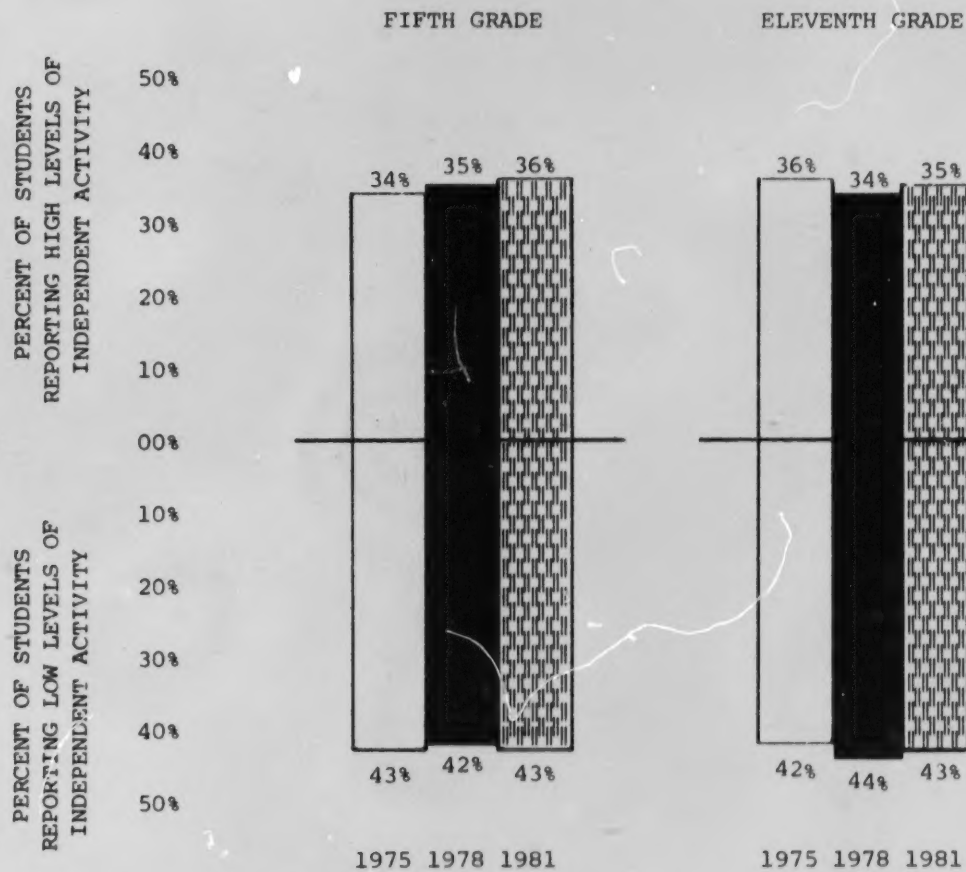


Exhibit 26

Results for Selected Items from the Independent Development Scale, Grades 5 and 11



particular items. On the balance of these example items, the 5th grade students had slightly higher levels of participation.

These results suggest the obvious question of whether schools can stimulate higher levels of independent learning. Stated alternately, what kinds of school activities or student characteristics are associated with high participation in independent learning activities? A later section of this chapter on the correlates of Independent Development will provide some information to help answer these questions.

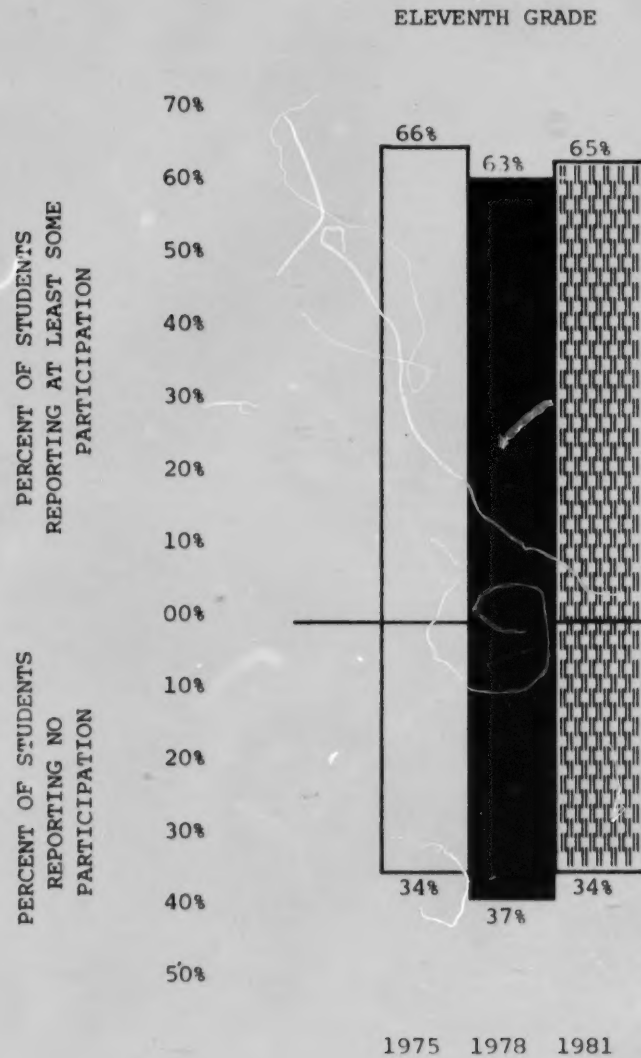
Results for the Career Development Experience Scale

This scale was focused on student participation in school career education activities rather than upon the student's personal career plans and activities. The scale provided an indication of how much emphasis is given to career development as part of the school curriculum. Exhibit 27 presents the 11th grade results for the Career Development Experience scale for 1975, 1978, and 1981. These results are somewhat disturbing in that over one-third of the 11th grade students reported no participation in the career experiences measured and other school activities covered in this scale. About two-thirds of the students reported at least some participation. The overall level of participation increased by a non-significant amount between 1978 and 1981 and remained lower than the 1975 level.

Three items from this scale were included at the 5th grade level, and results on these plus three additional items from the 11th grade scale are presented in Exhibit 28. Shown are the percentage of students

Exhibit 27

**Results from the
Career Development Experience Scale,
Grade 11**



responding to each alternative to each item. On the items which were common for both grade levels, there were relatively small differences in the 5th and 11th grade results. This was a somewhat disappointing finding in that the 11th grade students should have had considerably more exposure to Career Development Experience activities as they progressed through the educational system. The item that showed the most difference between the 5th and 11th grades was item 3, which requested the students to indicate how often they had studied how different jobs might influence their lives. On this item, 26% of the 11th grade students responded that they had studied this a number of times, while only 18% of the 5th grade students so responded. At the other end of the scale, 81% of the 5th grade students and 74% of the 11th grade students responded that they had studied how different jobs might influence their lives only twice or less during this school year, a finding which suggests that greater emphasis could be given to this area of the curriculum. The same phenomenon generally held for items 1 and 2, which also showed that a fairly large percentage of students had not been intensively exposed to career development experiences during their schooling.

On items 4, 5, and 6, where only 11th grade data were available, a similar picture emerges. Apparently the majority of students in Utah schools do not gain sufficient information about jobs through the educational system. These findings raise the question of whether greater emphasis on career planning and decision-making should be integrated into all parts of the curriculum rather than reserved for special programs or classes.

Exhibit 28

Results for Selected Items from the Career Development Experience Scale, Grades 5 and 11

ITEM	PERCENT OF STUDENTS CHOOSING EACH ALTERNATIVE	
	GRADE 5	GRADE 11
How often have you done the following activities during this school year?		
1. Studied different jobs and how much education and training they require?		
A. Not at all	27%	16%
B. At least once or twice	47%	53%
C. A number of times	26%	31%
2. Studied how jobs might change in the next ten years?		
A. Not at all	37%	36%
B. At least once or twice	43%	47%
C. A number of times	19%	16%
3. Studied how different jobs might influence your life?		
A. Not at all	35%	21%
B. At least once or twice	46%	53%
C. A number of times	18%	26%
4. Studied how jobs may differ in terms of opportunities for advancement, security, etc.?		
A. Not at all		26%
B. At least once or twice	*	52%
C. A number of times		21%
5. Studied how fast subject matter information changes as new knowledge is discovered?		
A. Not at all		57%
B. At least once or twice	*	33%
C. A number of times		9%
6. Compared the good and bad things of two different jobs?		
A. Not at all		23%
B. At least once or twice	*	51%
C. A number of times		26%

*Items not available at 5th grade.

While the results on the Career Development Experience items appear to point out worthwhile areas for attention to foster higher levels of student development, other available information indicated that some cautions may be in order. For example, in the 1975 Assessment, schools with high average scores on the Career Development Experience scale tended to have unfavorable scores on Internal Control, External Control, Aggression, and Anxiety. These earlier results, in conjunction with those obtained here, indicated that more attention could well be devoted to the Productive Maturity Goal area within the Utah educational system; however, care must be taken to promote growth in the other goal areas as well.

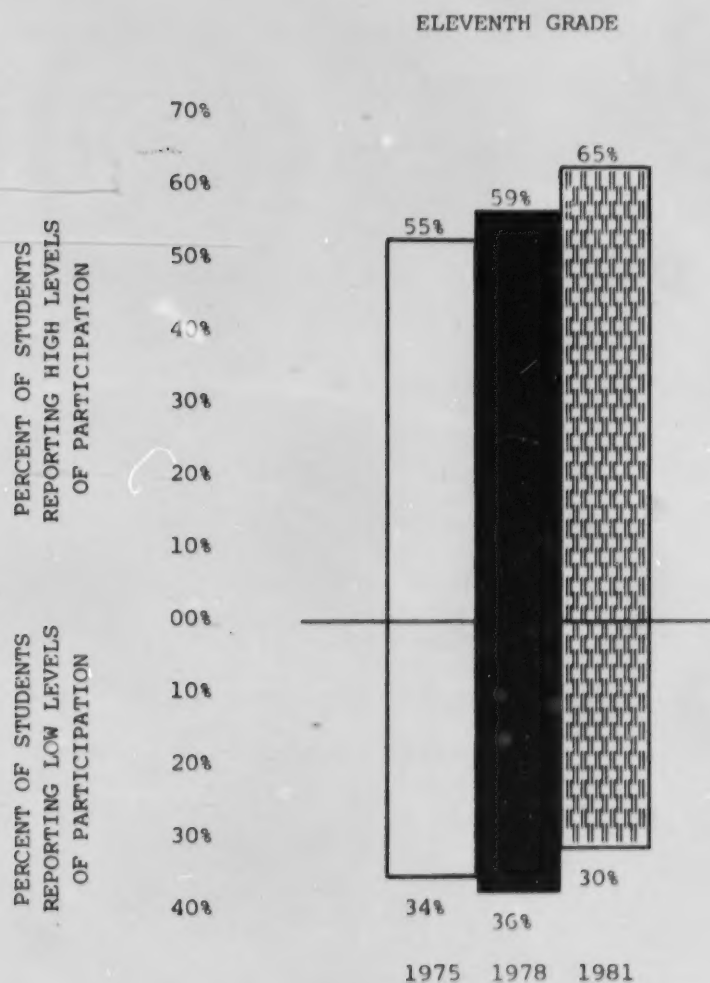
Results for the Career Awareness and Exploration Scale

This specially constructed measure dealt with the individual's level of maturity and awareness in making effective career decisions. There were 21 items in this scale for the 11th grade. Four items were used at the 5th grade. The percentages of 11th grade students reporting high and low levels of Career Awareness and Exploration activities for the 1975, 1978, and 1981 Assessments are shown in Exhibit 29. Results on the common items are presented in Exhibit 30 to allow comparisons between the 5th and 11th grades.

The results presented in Exhibit 29 show a marked improvement in students' exploring and becoming aware about career opportunities--the 1981 Assessment showed 65% of the students reporting high levels of participation in these activities compared to 59% in 1978. Still, nearly one-third of the 11th grade students have devoted little

Exhibit 29

**Results from the Career Awareness and
Exploration Scale, Grade 11**



attention to or have received little assistance with finding out about and planning a future career. Overall, the significant improvement may be a reflection of the Individual Education Plan provision which was written into the 1977 Graduation Requirements. These results, in conjunction with the results from the Career Development Experience scale, where no significant change occurred, indicate that student awareness has improved as a result of counseling and other activities such as having a career goal on record at the school, but that career education has not made additional significant movement into the classroom.

When administering questions of this kind to students in the 5th grade, a certain amount of caution is necessary in interpreting the results, since their responses may reflect some distortion due to their lack of experience and stage of development. On the other hand, the results shown in Exhibit 30 indicate some frankness and objectivity by all students responding to the various items. To illustrate, 79% of the 5th grade students believed their job future was good or very good, while at the 11th grade level, the percentage was 74.

On item 2, 9% of the 5th grade students had not thought about a job or career, while only 2% of the 11th grade students so responded. The 17% of 11th grade students who chose the alternative "have made definite plans and decisions" were probably more realistic and practical in their responses than were the 22% of the 5th grade sample. On question three, 18% of the 5th grade students had not thought about post high school education, while only 4% of the 11th grade students made this choice. In general, the 11th grade students had progressed toward making plans

Exhibit 30

Results for Selected Items from the Career Awareness and Exploration Scale, Grades 5 and 11

ITEM	PERCENT OF STUDENTS CHOOSING EACH ALTERNATIVE	
	GRADE 5	GRADE 11
1. How would you describe your job future?		
A. Very poor	2%	2%
B. Poor	2%	2%
C. Uncertain	17%	22%
D. Good	31%	46%
E. Very good	48%	28%
2. Have you decided upon a job or a career?		
A. Have not thought about it	9%	2%
B. Have a few ideas	32%	21%
C. Have made some tentative plans	12%	21%
D. Have made some plans and decisions	25%	39%
E. Have made definite plans and decisions	22%	17%
3. Have you decided about how much education, if any, that you want to obtain after high school?		
A. Have not thought about it	18%	4%
B. Have a few ideas	23%	16%
C. Have made some tentative plans	12%	21%
D. Have made some plans and decisions	23%	38%
E. Have made definite plans and decisions	24%	22%
4. What kind of work would provide you with an opportunity to use your talents and abilities?		
A. Haven't thought about it	22%	8%
B. Have thought about it a little	33%	31%
C. Have thought about it a lot	44%	61%

and some decisions about their future education.

On the last question, which requested the students to respond about what kind of work would provide them with an opportunity to use their talents and abilities, 39% of the 11th grade students responded that they had thought about it "a little" or less. While this indicates a higher level of career awareness than the 5th grade sample (55%), a large number of Utah students have not seriously considered the kind of work that would best use their talents and abilities.

Results for the Economic Awareness and Consumer Competence Scale

This cognitive measure was concerned with knowledge about elementary economic principles, facts relevant to being an effective consumer of goods, and basic characteristics of a variety of specific occupations. The total score, available only for the 11th grade, was based on 19 items. Five selected items from this scale were also administered to the 5th grade sample. Since the scale was specially constructed for the 1978 Assessment, comparisons of results to 1975 can not be made.

The results obtained on selected items from the Economic Awareness and Consumer Competence scale are presented in Exhibit 31. Results are shown for both grades 5 and 11. Looking at the percentages responding correctly across all five items shows a strong general maturation trend with 11th graders consistently responding correctly more often. In 1981, 62% of the 5th grade students and 87% of those at the 11th grade were correct in responding that having selling skills is an important attribute. Both of these percentages were slightly above those in 1978.

Exhibit 31

Results for Selected Economic Awareness and Consumer Competence Items, Grades 5 and 11

ITEM	PERCENT OF SAMPLE RESPONDING CORRECTLY			
	GRADE 5		GRADE 11	
	1978	1981	1978	1981
1. In this day and age, having selling skills is not important.				
A. True				
B. False -----	61%	62%	83%	87%
C. Don't know				
2. If one box of cereal contains 20 ounces and sells for 80¢ and another contains 9 ounces and sells for 39¢, which has the lower cost per ounce?				
A. The larger one -----	45%	49%	76%	77%
B. The smaller one				
C. Don't know				
3. Two snack foods are available-- Brand A and Brand B. Brand A contains sugar, salt, spices, and food coloring, while Brand B contains wheat, honey, and seasoning. Which contains the most food value?				
A. Brand A				
B. Brand B -----	79%	79%	94%	95%
C. Don't know				
4. The only way to get enough protein is to eat a lot of red meat.				
A. True				
B. False -----	73%	77%	89%	91%
C. Don't know				
5. Only the very poor people in this country suffer from poor nutrition.				
A. True				
B. False -----	63%	66%	92%	94%
C. Don't know				

Performance was lowest on item number 2, dealing with comparative cost per unit of two products--less than half of the 5th grade students and about three-fourths of the 11th grade students responded correctly. The remaining three items in the exhibit deal with various aspects of nutrition. On these, the students performed well, especially at the 11th grade, where about 90% responded correctly. For each of the items in Exhibit 31, performance in 1981 equalled or exceeded that of 1978.

In general, the results on the Economic Awareness and Consumer Competence items were positive, with demonstrated maturation effects, i.e., 11th grade students responded correctly more consistently than did 5th grade students. Moreover, the 1981 scores were higher than in 1978. One specific recommendation from this section would be for the schools to place emphasis on learning about comparing costs per unit when making decisions about purchasing products--an important concept for the consumer.

Results on Additional Productive Maturity Items

To supplement the items in the various scales pertaining to Productive Maturity previously discussed, several additional items relating specifically to Utah career education objectives were asked, primarily of the 11th grade students. Results for these items are presented in Exhibit 32. These results indicate that, while some of the goals in career education are being met within the state, there are real opportunities for improvement. For example, the first item shows that about half of the 11th grade students had not worked with a counselor or teacher in preparing an Individual Education Plan which identifies a

Exhibit 32

**Results for Selected
Career Planning Items, Grade 11**

ITEM	PERCENT OF STUDENTS CHOOSING EACH ALTERNATIVE
1. Have you worked with a counselor or teacher in preparing an individual education plan which identifies a list of courses you will take and a tentative career plan?	
A. Yes	47%
B. No	51%
2. Have you decided on a future occupation and specified a career goal that is on record at this school?	
A. Yes	54%
B. No	45%
3. During this school year, how often have you visited your school's career resource center or used materials from the center?	
A. No career resource center in this school	11%
B. Less than once a term	69%
C. 4 - 5 times	13%
D. More than 5 times	6%
4. Have you taken an interest test or inventory and had the results explained to you?	
A. No	34%
B. Yes, but did not have it explained	15%
C. Yes, but I didn't learn much	20%
D. Yes, and I learned something	26%
E. Yes, and I learned a lot	5%
5. Does your school provide enough training opportunities for someone like you to get a good full-time job if you want one after graduation?	
A. Yes	39%
B. Not sure	45%
C. No	15%

list of courses and a tentative career plan. As seen from the second item, almost half the students did not have a career goal on record at their school. Fully 69% had visited their school's career resource center less than once a term if at all--and an additional 11% reported that their school had no career resource center. About half the students had not taken an interest inventory where they had had the results explained to them. Nevertheless, the results on these career planning items were better than the results on corresponding items in 1978. That is, there was some improvement between 1978 and 1981, although there is still room for more improvement.

On the other hand, the fifth item in Exhibit 32 shows that only 39% of the 11th grade students felt that their school provided enough training opportunities for them to get a good full-time job after graduation. This was a decline from 44% in 1978. These results indicate a general need for more emphasis within the schools on preparing students to engage in work as a part of their way of living.

Correlates of Independent Development--
Individual Student Level of Analysis

Since the relationships between the Independent Development scale and the other measures included in the Statewide Assessment were similar for the 5th and 11th grades, they will be discussed together. The relationship between the Independent Development scale and the Mathematics Total score from the Intellectual Maturity Goal area was very limited on the 5th grade ($r = .12$), and only slightly higher for the 11th grade ($r = .20$). Similar results were obtained with the total Reading score at the 5th grade level; the relationship between

Independent Development and total Reading at the 11th grade level was somewhat stronger ($r = .27$). These data indicated that students with high Independent Development scores may have been participating in activities which they defined as important, but which had only limited benefit in improving mathematics achievement test scores. Perhaps some benefit in reading achievement was obtained at the higher grade level.

Generally, the picture of students who scored high on Independent Development and were effective in self-initiated learning outside of the school system is one of a positive outlook as manifested by generally moderate relationships between this scale and the Emotional Maturity scales. Of these, Autonomy had the highest relationship with Independent Development ($r = .44$ at grade 5 and $.48$ at grade 11). These relationships supported the validity of the measures, because someone who is high on independent, self-initiated learning would also be expected to be self-sufficient and self-directing. The self-initiated learner was also above average on the other Emotional Maturity scores--Academic Self-Concept and Self-Acceptance.

The Social Maturity area scales of Peer Relations (5th and 11th grades) and Extracurricular Activities (11th grade only) also had generally moderate relationships with the Independent Development scale, suggesting that the students who were high on self-initiated learning were also well-respected and enjoyed by their peers and were active in the school. Both measures of the Aesthetic Maturity Goal area had significant relationships with the Independent Development scale. Finally, students with higher scores on Independent Development tended to enjoy school more.

Correlates of Independent Development-- Grade 5--Classroom Level of Analysis

For the classroom level of analysis, the scores of individual students within classrooms were averaged and these averages were intercorrelated. Generally, the results obtained from the classroom level of analysis paralleled those obtained at the individual level.

Three of the process measures--Reinforcement of Self-Concept, Classroom Participation, and Development of Career Talents--had significant relationships with the Independent Development score; missing were the Individualization of Instruction scale and the Expectations scale. The process scores with the highest relationships with Independent Development were Reinforcement of Self-Concept ($r = .56$), Classroom Participation ($r = .54$), and Development of Career Talents ($r = .51$). All of these measures involved some concern and recognition for the individual student's capabilities. These results pointed out teaching strategies associated with higher levels of Independent Development, strategies that should be seriously considered by educators to promote higher levels of learning outside the classroom.

Demographic Correlates of Productive Maturity

In comparison to the relatively strong relationship between Socioeconomic Status and the Intellectual Maturity scales, Independent Development had a lower relationship (r 's in the .20s) with SES, indicating only a slight tendency for students from high SES families to be more involved with self-initiated learning activities. The Economic Awareness and Consumer Competence scale also had a significant

relationship with SES ($r = .36$) on the 11th grade sample. These results suggest opportunities for improvement in the Productive Maturity Goal area for low income students. Neither school size nor school location had an appreciable influence on the Independent Development score at either grade level, although students in smaller schools tended to have slightly lower scores for Career Awareness and Exploration, and Economic Awareness and Consumer Competence.

Summary

Four different scales for this goal area were administered to 11th grade students; only one of these--Independent Development--was also administered to the 5th grade students. Selected items from the Career Awareness and Exploration scale, the Career Development Experience scale, and the Economic Awareness and Consumer Competence scale were administered to the 5th grade students, although these scales were designed primarily for 11th grade students. A brief listing of the results of the measures for this goal follow:

- (1) The 5th grade 1981 results, compared to 1978, showed no real change in Independent Development. The proportion of students who actively participated in self-initiated learning activities was relatively small--barely more than a third.
- (2) The 11th grade 1981 results, compared to 1978, showed no real change in Independent Development, a slight but non-significant increase in Career Development Experience, and a substantial increase in Career Awareness and Exploration.
- (3) The students' scores on items relating to Economic Awareness and Consumer Competence increased somewhat from 1978 to 1981 and indicate moderately high levels of knowledge.

- (4) Although more 11th grade students reported having made some plans and decisions about their future education and careers, having used their school's career resource center, and having received help from the school in planning courses of study related to tentative career choices, fewer students felt that their school provided sufficient training for employment after graduation. Despite some advances from 1978 to 1981, there is still room for improvement in such career education areas as student use of career resource centers, student participation in work observation as a way of learning about jobs, parental involvement, etc. In addition, improved efforts should be made to make education more relevant to career activities.
- (5) Students who scored at high levels on the Independent Development scale tended to have high scores on the Emotional Maturity scales, the Social Maturity scales, and the Aesthetic Maturity scales. They also reported that they enjoyed school more. These are positive indicators that greater levels of self-initiated learning activities should be strongly encouraged.
- (6) Examples of instructional strategies which led to higher levels of Independent Development were Reinforcement of Self-Concept, Classroom Participation, and Development of Career Talents.
- (7) Students from lower SES backgrounds tended to have somewhat lower scores for the Independent Development scale at both grade levels, and lower scores at the 11th grade for the Career Awareness and Exploration scale and the Economic Awareness and Consumer Competence scale.

CHAPTER IX

RESULTS FOR ENJOYMENT OF SCHOOL

Enjoyment of school is an important concern for Utah educators. The Enjoyment of School scale developed especially for the 1975 study was based on the student's reported overall enjoyment of school. High scores on this scale indicated that the students almost always did a lot of things in school that they enjoyed, often got excited about what was happening in class, and often studied something they enjoyed learning about. High-scoring students also reported that time passed quickly while they were in school and that they would not want to transfer to a different school if given the chance.

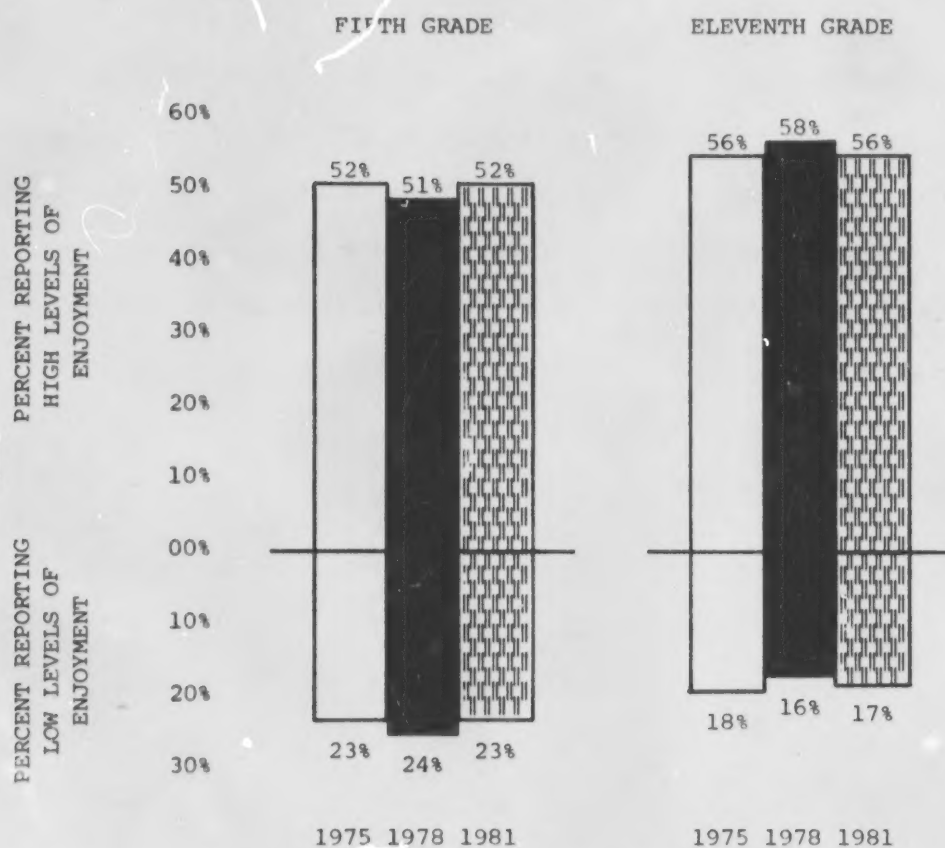
Results for the Enjoyment of School Scale

A comparison of 1975, 1978, and 1981 results for 5th and 11th grade students on the Enjoyment of School scale is presented in Exhibit 33. As in most other exhibits, the average percentage of students choosing the two most positive alternatives is contrasted with the percentage choosing the two least favorable alternatives. The results indicate essentially no change from 1975 to 1981 at either grade.

The results indicated that 11th grade students were more positive about school than were the 5th grade students. As students mature, they come to view the educational process in a somewhat less negative fashion. An alternate explanation is that those students expressing dissatisfaction at the 5th grade are no longer in the school system at

Exhibit 33

**Results from the Enjoyment of School Scale,
Grades 5 and 11**



grade 11, because their dislike for school has resulted in their dropping out or seeking alternative forms of education.

Four selected Enjoyment of School items are presented in Exhibit 34 with results for the 5th and 11th grades. The 5th grade students tended to be more varied in their responding than 11th graders, with a higher percentage choosing alternatives at each extreme of the scale. For example, on item 1, 31% of the 5th grade students answered "almost always" to describe how well they liked school; whereas, on the alternative "almost never," the percentage was 14. In contrast, for the 11th grade students these percentages were 23 and 6, respectively. While the percentages for these questions can be perceived as generally encouraging, i.e., most of the 5th grade students reported that they usually or almost always like school, the percentage choosing the D and E alternatives was sometimes disturbing. For example, from item 1, 22% of the 5th grade students do not like school very often. This represents an important challenge to Utah educators to make the learning experiences and time in school more enjoyable for these students. Item 3 presents a similar picture, as 22% of the 5th grade students responded that they disliked school and would be glad to finish or were often a little unhappy with school.

Relationships with Other Measures

The importance of the Enjoyment of School scale can be illustrated further by considering its pattern of relationships with other measures. Without exception, the relationships of the Enjoyment of School scale were in the positive direction with all other indicators included in the

Exhibit 34

Results for Selected Items from the Enjoyment of School Scale, Grades 5 and 11

ITEM	PERCENT OF STUDENTS CHOOSING EACH ALTERNATIVE	
	GRADE 5	GRADE 11
1. Do you like school?		
A. Almost always	31%	23%
B. Usually	21%	35%
C. Sometimes	26%	28%
D. Not very often	8%	8%
E. Almost never	14%	6%
2. How often do you study something at school that you really enjoy learning about?		
A. Two or more times a day	35%	31%
B. About once a day	31%	34%
C. Once or twice a week	19%	21%
D. A few times a month	9%	11%
E. Almost never	6%	3%
3. How do you feel about school?		
A. Like it very much	24%	18%
B. Like it most of the time	40%	51%
C. Just accept it as necessary	15%	20%
D. Am often a little unhappy with it	8%	7%
E. Dislike it and will be glad to finish	14%	4%
4. Overall, I would say the time I have spent in school has been:		
A. very enjoyable.	19%	18%
B. enjoyable.	32%	50%
C. so, so.	37%	26%
D. pretty boring.	8%	4%
E. very boring.	4%	1%

Statewide Assessment battery. That is, students who scored high on the Enjoyment of School scale had higher than average scores on all the other scales, including the achievement measures and the key measures from each goal area. However, these relationships were not always very strong. For example, the highest relationship between Enjoyment of School and the key goal area measures was with the Academic Self-Concept scale from Emotional Maturity ($r = .42$ for the 5th grade and $.51$ for the 11th grade). Enjoyment of School had modest relationships with the Peer Relations scale from Social Maturity (r 's in the low $.30$ s) and with the Independent Development scale from Productive Maturity ($r = .34$ for the 5th grade and $.29$ for the 11th grade) and fairly low relationships with the Mathematics Total score from Intellectual Maturity ($r = .20$ for the 5th grade and $.15$ for the 11th grade) and with Music Achievement from Aesthetic Maturity ($r = .22$ for the 5th grade and $.27$ for the 11th grade).

At the 5th grade classroom level, the relationships between classroom average scores on Enjoyment of School and the educational process measures were examined. The Enjoyment of School scale had statistically significant positive relationships with the educational process measures of Individualization of Instruction, Reinforcement of Self-Concept, Classroom Participation, and Development of Career Talents. Of particular note was the high relationship ($r = .53$) between Reinforcement of Self-Concept and Enjoyment of School. In those classrooms in which the students were made to feel good about their classwork, heard when they did a good job, were made to feel important, etc., the students had higher Enjoyment of School scores. There was

also a strong relationship between Enjoyment of School and Development of Career Talents ($r = .54$), indicating that students enjoyed school more in classes where they received skills which had broader application than immediate academic content, where they talked about possible aspects of the future, where they discussed how they might use what they were learning in class, etc.

In view of the significant relationships obtained between the educational process measures and the Enjoyment of School measure, higher levels of performance on the Enjoyment of School score appeared attainable through the use of selected instructional strategies. Since the Enjoyment of School scale did have a consistent pattern of positive relationships with the key measures from the other goal areas studied, such results could have an important payoff in the development of Utah students.

The Enjoyment of School scale had limited relationships with the demographic variables. The scale was slightly related to Socioeconomic Status, with a tendency for students from higher income homes to have slightly higher Enjoyment of School scores. Also, females tended to have slightly higher Enjoyment of School.

Summary

The Enjoyment of School scale measured the students' perceptions of the degree to which the school experience was enjoyable, interesting, exciting, etc. Summaries of the more important results of the assessment of this area follow:

- (1) At both grade levels, a large percentage of Utah students indicated that they enjoyed school; 11th grade students had somewhat higher scores than did 5th grade students.
- (2) There was no appreciable change on the Enjoyment of School scale over the years 1975, 1978, and 1981.
- (3) Enjoyment of School had statistically significant relationships with scores in all the other key goal areas measured in this study.
- (4) Students with higher scores for SES tended to report greater enjoyment of school, as did females.
- (5) Classrooms in which students reported high levels of Reinforcement of Self-Concept, Classroom Participation, Development of Career Talents, or Individualization of Instruction tended to have students who enjoyed school more.

CHAPTER X

EDUCATIONAL PROCESS MEASURES

Information from students was used to obtain the educational process data. Full scales were only included in the Assessment battery for 5th grade students; the items resulted in five subscores based on student descriptions of classroom practices. At the 11th grade, selected items were included in 1981 which could be compared to 1975; full scales were not used because each high school student has several teachers and is therefore less influenced by the educational processes used in any one classroom.

Description of the Measurement Instruments

The inclusion of specially constructed educational process measures in the Statewide Assessment made the project unusually comprehensive in its coverage. Four of these educational process measures (Individualization of Instruction, Reinforcement of Self-Concept, Classroom Participation, and Development of Career Talents) were available from previous studies by IBRIC, and were modified for the 1975 study. The fifth process measure (Expectations) was newly constructed for the 1975 Assessment project. All of these measures consisted of multiple-choice items completed by students to describe specific events and activities occurring in the classroom. In describing educational processes, the students are an important source of information, since they are directly affected by and have a good opportunity to observe classroom practices.

Alternate procedures of classroom observations generally introduce a bias into the measurement situation caused by the observer, and are exceedingly expensive and impractical for a statewide study.

The items in these educational process scales were developed and selected on the basis of the degree of agreement among students in reporting their observations of classroom events; thus, the scores were generally reliable indicators of the extent to which various teaching practices were used. Brief descriptions of each of these scales follow.

The Individualization of Instruction score was a measure of the degree to which certain procedures were used to adapt curriculum content and learning processes specifically to the individual student's needs. Students in a class with a high average score on this scale reported that they had some choice in their learning activities. They reported that individual students in the classroom "often" or "very often" worked on different learning tasks, and that a number of different activities were often ongoing within the classroom at one time. They also indicated that lessons and assignments were not the same for all students, and that students were often able to choose from different materials when working on an assignment.

The Reinforcement of Self-Concept scale reflected students' perceptions of whether good performances were recognized. High scores indicated that the teacher very often made students feel good about themselves and their schoolwork, and that students very often were told when they had done a good job. The students in the class had a chance to see things other students had done well, were often encouraged to tell each other that they had done a good job, and were proud of the

things that they did in class.

A high Classroom Participation score occurred when the students described their classroom as a place of open discussion where all students were encouraged to participate. High scores indicated that the teachers very often encouraged students to speak out and take part in class, to ask questions, and to take part in discussing subjects not closely related to the class subject. A high score also suggested having many activities in the classroom which involved each student's participation.

The Development of Career Talents scale measured the reported amount of training students received in skills which had broader application than immediate academic content. Students in a class with a high average score on this scale reported that they were often involved in evaluation activities, including evaluation of their own work, other events, and ideas. They responded that they often talked about possible aspects of the future, how information learned in the class could be used in different jobs, and how they might use what they were learning in class. They had activities where everyone had to think up new ideas, and where the students worked together on a group project.

The Expectations scale was a measure of the students' perceptions of the amount of effort required of them in their class. Classes with high average scores in this area had a high percentage of students who reported that their assignments usually required a considerable amount of work and that everyone in the class was expected to do his or her best. High scores also indicated that the students were expected to do a lot of work, to work about as hard as they could, and to try hard to

learn all of the material.

Student-Reported Frequency of Use of Educational Processes

Exhibit 35 shows the percentage of the 5th grade students choosing alternatives that describe high frequency of use for each of the classroom processes measured. In this exhibit, a 2% change should be considered statistically significant. The results show general and significant increases from 1975 to 1981 for three of the five measures (Classroom Participation, Reinforcement of Self-Concept, and Development of Career Talents). These last two, in particular, increased significantly since 1978. Expectations improved substantially from 1975 to 1978, but then declined by a significant amount, although the 1981 level remained well above the 1975 level. Individualization of Instruction, which had held steady from 1975 to 1978, declined by a significant amount from 1978 to 1981.

Exhibit 36 presents the results of selected items from the educational process scales, one item for each scale. The questions in this exhibit were not given to the 11th grade students in 1978; the full scales were not given to the 11th grade, for reasons cited earlier. Item 5 is the only item shown which had a high percentage of students selecting the "almost always" or "usually" alternatives; this item was from the Expectations scale. On this item, the responses "almost always" or "usually" were selected by a higher percentage of 5th grade students in 1981 than in 1975. The same was true at the 11th grade, and, in fact, the pattern of responses was very similar between the 5th grade and the 11th grade.

Exhibit 35

Frequency of Use of Different Instructional Strategies as Indicated by the Educational Process Measures, Grade 5

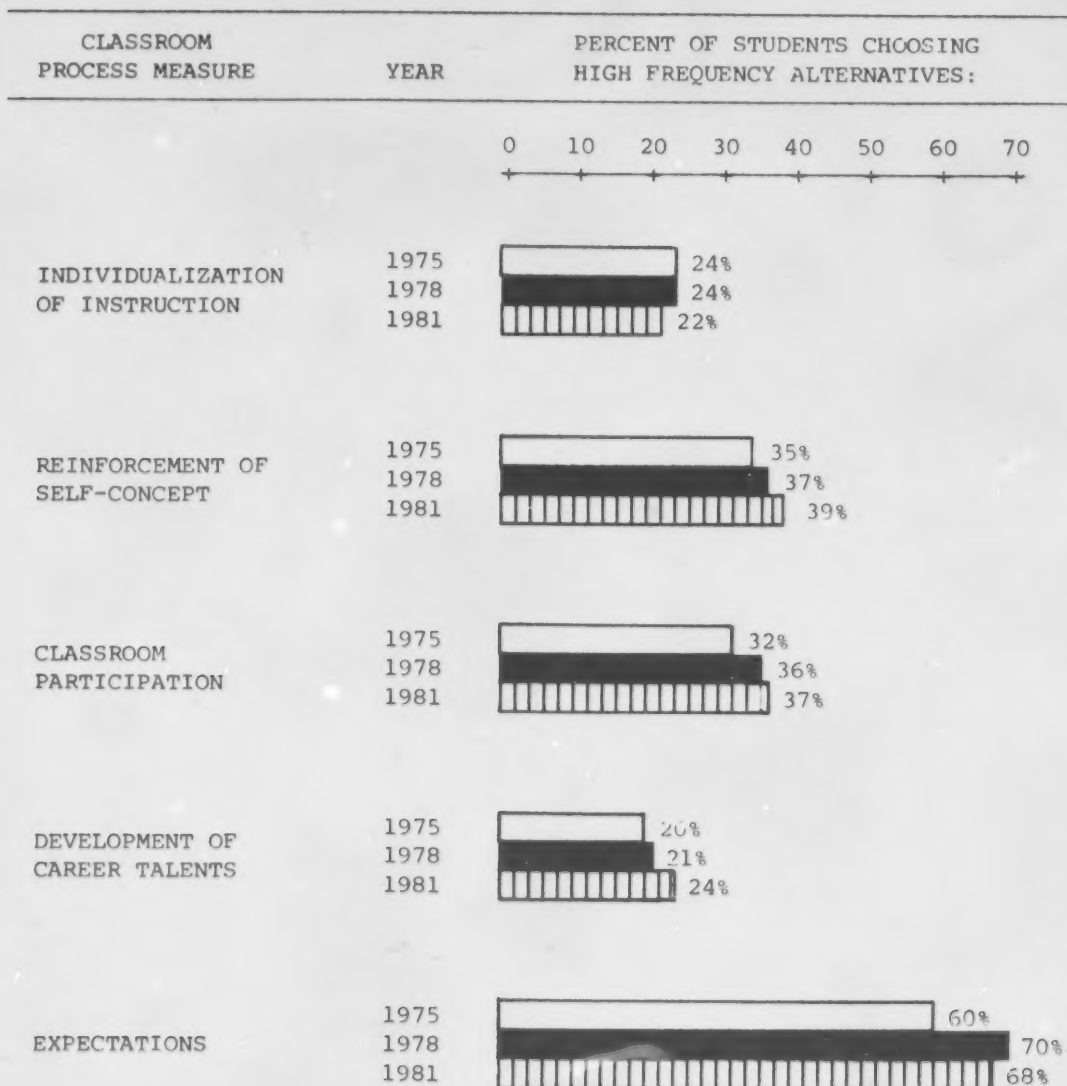


Exhibit 36

Results for Selected Educational Process Items, Grades 5 and 11

ITEM	PERCENT OF STUDENTS CHOOSING EACH ALTERNATIVE			
	GRADE 5		GRADE 11	
	1975	1981	1975	1981
1. How often do students work on different assignments in class at the same time?				
A. Almost always	11%	11%	8%	14%
B. Usually	21%	17%	15%	11%
C. Sometimes	38%	32%	35%	29%
D. Not very often	20%	24%	24%	23%
E. Almost never	9%	16%	17%	23%
2. How often do you hear about it when you have done a good job?				
A. Almost never	17%	13%	26%	20%
B. Rarely, once a month or so	24%	21%	30%	24%
C. Sometimes, about once a week	32%	31%	27%	31%
D. Often, 2 or 3 times a week	20%	22%	13%	17%
E. Very often, once a day or more	7%	14%	4%	9%
3. How often do you have class discussions where many students are involved?				
A. Almost never	13%	11%	16%	19%
B. Rarely, once a month or so	23%	20%	22%	17%
C. Sometimes, about once a week	31%	30%	29%	26%
D. Often, 2 or 3 times a week	23%	24%	23%	23%
E. Very often, once a day or more	10%	14%	10%	15%
4. Does your class study how your lives will change in the future?				
A. Almost never	34%	32%	26%	43%
B. Rarely, once a month or so	28%	26%	27%	23%
C. Sometimes, about once a week	23%	24%	27%	19%
D. Often, 2 or 3 times a week	11%	13%	15%	10%
E. Very often, once a day or more	4%	5%	5%	6%
5. Does your teacher expect a student to work hard in this class to get a good grade?				
A. Almost always	37%	62%	31%	57%
B. Usually	36%	25%	40%	30%
C. Sometimes	20%	9%	20%	8%
D. Not very often	6%	2%	7%	3%
E. Almost never	2%	1%	2%	2%

However, apart from any consideration of increases or decreases over time, there are real opportunities for improvement in four of the five processes measured. Exhibit 35 shows that a relatively small percentage of the Utah students described the teaching techniques of Individualization of Instruction, Reinforcement of Self-Concept, Classroom Participation, or Development of Career Talents as being frequently used in their classrooms. Expectations is apparently much more characteristic of Utah's educational system, as the majority of students used alternatives indicating high frequency for this teaching strategy. However, there were substantial variations between classrooms and between schools on this measure and these differences were associated with different levels of student performance on achievement measures, indicating that higher levels of expectations could be applied in many of Utah's classrooms.

Relationships with Key Outcome Measures

The most important question about the educational process measures described above concerns the relationship between these measures and student outcome measures. To simplify this analysis, the key measures from each goal area were selected and their relationships with the educational process measures were determined. The key measures selected included the CTBS Mathematics Total score from the Intellectual Maturity Goal area, the Academic Self-Concept scale from the Emotional Maturity Goal area, the Peer Relations scale from the Social Maturity Goal area, the Music Achievement scale from the Aesthetic Maturity Goal area, and the Independent Development scale from the Productive Maturity Goal

area. In addition, a measure of an objective which is not directly stated in any of the goals, but which is implied in most of them--the Enjoyment of School scale--was included.

A brief summary of the statistically significant relationships found between these educational process measures and the key measures for each goal area is presented in Exhibit 37. The Individualization of Instruction scale had the least number of statistically significant relationships with the outcome measures, only correlating with Peer Relations and Enjoyment of School. In comparison with the other educational process measures, these relationships were somewhat lower, i.e., this scale and/or the underlying procedures measured were not as powerful as the other process measures. However, these relationships supported the current widespread emphasis on individualization of instruction in Utah schools.

The Reinforcement of Self-Concept scale had significant relationships with all of the key goal area measures, except the Mathematics Total score from the Intellectual Maturity Goal area. This educational process measure was most highly related ($r = .56$) to the Independent Development scale. These results indicated that reinforcement of self-concept is an important aspect of instruction, encouraging students to engage in self-initiated learning activities. The relationship between Reinforcement of Self-Concept and Enjoyment of School indicates that the process of education was more enjoyable for students when they received recognition and positive feedback for the things they did well.

Exhibit 37

**Relationships of Educational Process Measures
to Key Performance Measures for Each Goal Area**

EDUCATIONAL PROCESS MEASURES
RELATED TO

STUDENT OUTCOME MEASURES

INDIVIDUALIZATION OF INSTRUCTION

Social Maturity:
Peer Relations
Enjoyment of School

REINFORCEMENT OF SELF-CONCEPT

Emotional Maturity:
Academic Self-Concept
Social Maturity:
Peer Relations
Aesthetic Maturity:
Music Achievement
Productive Maturity:
Independent Development
Enjoyment of School

CLASSROOM PARTICIPATION

Emotional Maturity:
Academic Self-Concept
Social Maturity:
Peer Relations
Aesthetic Maturity:
Music Achievement
Productive Maturity:
Independent Development
Enjoyment of School

DEVELOPMENT OF CAREER TALENTS

Emotional Maturity:
Academic Self-Concept
Social Maturity:
Peer Relations
Productive Maturity:
Independent Development
Enjoyment of School

EXPECTATIONS

Intellectual Maturity:
CTBS Mathematics
Social Maturity:
Peer Relations
Aesthetic Maturity:
Music Achievement

Classroom Participation had a pattern of relationships similar to that of Reinforcement of Self-Concept. It was significantly related to Academic Self-Concept, Peer Relations, Music Achievement, Independent Development, and Enjoyment of School. Like Reinforcement of Self-Concept, Classroom Participation was most strongly related ($r = .54$) to Independent Development, suggesting that increasing students' participation in the classroom promotes their orientation toward learning on their own outside of the school system.

The Development of Career Talents scale was significantly related to Academic Self-Concept, Peer Relations, Independent Development, and Enjoyment of School. Development of Career Talents had the highest relationship with Enjoyment of School ($r = .54$), indicating that the process of education was more enjoyable for students when they discussed how information learned in class could be used in different jobs, talked about possible aspects of the future, and received educational experiences that had broader application than immediate academic content.

The Expectations scale was related to CTBS Mathematics, Peer Relations, and, most strongly ($r = .31$), to Music Achievement. However, the relationship between Expectations and CTBS Mathematics was not as strong as it had been in the past ($r = .43$ in 1975, $.26$ in 1978, and $.21$ in 1981). Still, in classes where students were expected to do a lot of work and to do their best, the students did in fact have somewhat higher levels of performance than in classrooms where expectations were not so high.

An overview of these results suggests that high levels of Expectations, combined with positive applications of the other instructional strategies, was associated with higher levels of performance on the key scales for the goal areas in the Utah Statewide Educational Assessment.

The educational process measures had low to moderate relationships with SES. Specifically, SES was related to Reinforcement of Self-Concept ($r = .43$), Classroom Participation ($r = .32$), and Expectations ($r = .26$). Except for Expectations, these relationships were substantially stronger than in previous Assessments--a cause for some concern. Students in classrooms in higher income areas reported having received more positive reinforcement, having participated more in class, and having been expected to perform at higher levels of achievement. The Assessment data do not provide information about alternative explanations, i.e., whether teachers adjust their activities and expectations to match the likely level of class performance or whether teachers have stereotypes about students from different income levels.

Observed relationships between the educational process measures and key educational outcome measures may be moderated somewhat by the influence of SES, to the extent that SES may be related to both the processes and the outcomes. Nevertheless, the weight of evidence is that the educational processes have significant impacts on key educational outcomes.

Summary

Educational process was measured by information from the students as they described their classroom activities. Five educational process measures--Individualization of Instruction, Reinforcement of Self-Concept, Classroom Participation, Development of Career Talents, and Expectations--were administered as part of the Assessment battery. The analyses of the information based on the student descriptions indicated that:

- (1) With the exception of Expectations, the educational processes measured in this study were generally not extensively used in Utah's schools. However, Reinforcement of Self-Concept, Classroom Participation, and Development of Career Talents have been inching upwards since 1975. While substantially higher levels were reported for Expectations than for the other process measures, there were still marked differences across classrooms. Both Individualization of Instruction and Expectations declined by significant amounts between 1978 and 1981.
- (2) Each of the key goal area measures was significantly related to one or more of the five student-reported educational process measures. These results provide supportive evidence that these instructional processes should be more widely used throughout the state, and that additional research on these and other process measures is strongly warranted.
- (3) Four of the educational process measures were significantly related to the Enjoyment of School measure--that is, high levels of these educational processes in classrooms were associated with above average levels of Enjoyment of School.
- (4) Students from lower socioeconomic backgrounds reported less Reinforcement of Self-Concept, Classroom Participation, and Expectations.

CHAPTER XI

SCHOOL CLASSIFICATIONS AND DEMOGRAPHIC CHARACTERISTICS

The school classifications and demographic characteristics of the sample were of interest to the project for various reasons. Principally, this was because such variables might help to explain differences found in educational attainment among the students tested in the State of Utah. There are many possible explanations for the relationships found among the school classifications and demographic characteristics and the other variables studied in this project, but the Socioeconomic Status variable seemed to have overriding pervasive effects. These effects have to be considered in interpreting the nature of the other demographic variables.

Socioeconomic Status

Throughout this report, from the review of related studies through the results, the significance and influence of SES on other measures has been discussed. While there can be no doubt about the impact of SES on the development of student capabilities and performance, the measure itself has not been discussed.

The present study followed the procedures developed in the 1975 Assessment, in which SES was defined by two subscores and a total score. The first subscore included indicators of financial socioeconomic status as measured by such items as the occupation of the father and mother, the number of books in the home, whether the student had a place to

study, etc. The second subscore contained items dealing with the family's educational orientation, and involved such characteristics as the education of the father and mother, the judged importance of education in the home, and whether it was important for the student to go to college. The total score was a composite of the two subscores. This total score has been referred to when relationships with SES have been discussed. The SES scales were constructed on the basis of previous research findings, generally following the precedents used in earlier studies; however, the combination of items used in the present study was unique.

On the surface, the items in these scales have no real explanatory power; they are indicators which do not in any way attempt to cover all the underlying concepts of SES. While the underlying characteristics and correlates of SES cannot be extensively discussed here, they have been studied elsewhere with no resultant agreement about how they interact or which are crucial. Some of the underlying characteristics that have been mentioned in a number of different studies include family background, early learning experiences, influence of peer group, diet, genetic endowment, education of parents, the aspiration of role models, etc. Finally, not only is the objective environment a crucial concern, but this is modified by the child's perception of it. In addition to these and other separate components, the combination and interaction among them are extremely difficult to quantify and measure; but cumulatively they do have an effect as assessed by the relatively simple items included in the present study. They have such an effect, in fact, that Bryant et al. (1974) concluded that the effect of SES cannot be

overemphasized and that SES alone would account for between 10 and 25 percent of the variance in academic scores.

The definition or nature of the crucial characteristics that underlie the measurement of SES are not necessarily the concern of the educational system. Rather, the educational system must be directed toward helping to overcome any disadvantages of children from lower SES families and providing them with at least equal opportunities to develop their capabilities.

The effects of SES observed in the study will be quickly summarized by reviewing the relationships between SES and the key measure from each goal area for the 5th and 11th grades. On 5th grade students, the effects of SES were most clear on the CTBS Mathematics score ($r = .37$) and the Music Achievement scale ($r = .45$). While all were statistically significant, the relationships of SES with key measures from the other goal areas were of lesser magnitude.

At the 11th grade individual student level, the relationships were about the same as those found on 5th grade students (the correlation of SES with CTBS Mathematics was .36 and with Music Achievement was .37). Relationships with the key measures from the other goal areas again approximated the relationships found on 5th grade students. The measures that were available on 11th grade students and not on 5th grade students were also generally related to SES. For example, the results obtained with the Career Awareness and Exploration scale ($r = .30$ with SES) and the Economic Awareness and Consumer Competence scale ($r = .36$ with SES) indicated that students from the high SES homes generally had an advantage over children from lower income homes.

There are no easy answers for how the impact of SES can be overcome. Certainly, the problem should concern society as a whole, not just the educational system. Particularly disturbing was the finding that the relationships of the educational process measures with the key outcome measures were not completely independent of the effects of SES. These results indicated that students in classrooms in lower income areas reported having received less positive reinforcement, having participated less in class, and having not been expected to perform at higher levels of achievement. These findings may merely reflect student perceptions, but they may also reflect classroom realities. In either case, there is no shortage of problems and opportunities for educators and researchers to attack.

School Size and Location

Size of school did not have any significant relationships with the key measures in each goal area at the 5th grade level. That is, students from small elementary schools did about as well on the educational attainment variables as students from the larger elementary schools. The same was true of 5th grade students from rural, urban, and suburban schools; there were essentially no differences in their performance on the Assessment measures.

At the 11th grade level, students from smaller schools tended not to do as well as students from the larger schools, although the differences were small. This was true for the Intellectual Maturity measures, the Aesthetic Maturity measures, two of the Productive Maturity measures (Career Awareness and Exploration, and Economic

Awareness and Consumer Competence), and Peer Relations (an Emotional Maturity measure). However, smaller schools tended to have higher scores for Extracurricular Activities. Perhaps there was less competition for the extracurricular activities available in small schools, allowing more students to participate; perhaps small schools were more intimate and encouraged more students to become involved; or perhaps there were fewer opportunities for non-school activities in the less-populated areas in which small high schools are found and, hence, more participation in activities at school. In any case, all of the relationships between school size and the key educational outcome measures were rather small, and most (the exception being Extracurricular Activities) were moderated by SES, which was somewhat related to school size.

School location did not have much impact on the 11th grade educational outcome measures. Students in rural high schools performed at roughly the same levels as their suburban and urban counterparts, except on the CTBS Mathematics and Reading scores, where the rural students were slightly lower. However, school size, SES, and school location were all interrelated, meaning that school location may not have had a significant impact once SES and school size are taken into account.

Race

White students performed at higher levels on the CTBS achievement test scores than did minority students. Part of this might be explained by the expected cultural bias found in the standardized achievement

tests--white students typically have some advantage on such tests. Furthermore, if the effects of SES are considered, the performance of the minority students more nearly approximated that of the white students, a fact which represents a further challenge to educators and society as a whole.

Racial differences of any consequence generally were not found for the 5th grade on the scales specially developed for Statewide Assessment (e.g., Academic Self-Concept, Peer Relations, Independent Development, etc.). Minority students scored at about the same level as white students on these scales. The potential of the minority student was not effectively tapped by the traditional academic achievement tests, and other sources of information need to be routinely used by the educational system, e.g., the scales from the current study.

At the 11th grade level, only a few differences existed among the various ethnic groups on the measures studied. Along with the CTBS achievement tests, whites did score higher on Art Achievement, Music Achievement, Economic Awareness and Consumer Competence, and Autonomy. Most of these score areas have a component of cognitive achievement. Further, the 11th grade data reflect a smaller percentage of minority students which may reflect a high dropout rate for these students.

Sex

There were minor sex differences evident in the educational outcome data. Females at both grade levels tended to enjoy school more and to have higher scores for Music Achievement. The higher scores for Music Achievement are consistent with the greater participation of females at

the 11th grade in extracurricular activities related to music. As noted previously, females generally participated more in non-athletic activities than did males, but participated less in athletics (possibly because of lack of interest, possibly because of lack of opportunity--the data did not illuminate the reason). Females also tended to report better Peer Relations at the 11th grade. Differences in academic achievement were very slight, although females scored slightly higher on both Mathematics and Reading in the 5th grade, and on Reading in the 11th grade.

Summary

School classification and demographic characteristics were included in Statewide Assessment to provide information concerning alternate explanations for the educational attainment of the students tested. The variables examined in this chapter were SES, school size, school location, race, and sex. Following is a brief summary of the major results yielded by an examination of these variables and their relationships with the other measures included in the study:

- (1) SES was the demographic measure most strongly related to the educational outcome measures, showing a pattern of low to moderate relationships at both grade levels. SES was most closely related to measures of academic achievement.
- (2) SES had a pattern of low to moderate relationships with three of the educational process measures (Reinforcement of Self-Concept, Classroom Participation, and Expectations). This suggests that greater use of these processes may be appropriate in classrooms in lower socioeconomic areas.
- (3) Partly due to the influence of SES, students in small high schools tended to have somewhat lower scores on a variety

of educational outcomes, although the differences were not great. The exception was Extracurricular Activities: students in small schools tended to participate more.

- (4) School location had very little relationship with educational outcomes, especially after SES and school size were taken into account.
- (5) Race was significantly related to academic performance, with minority students scoring slightly lower than whites. This was at least partially explained by the influence of SES.
- (6) Minor sex differences were evident, primarily for Music Achievement: females generally scored slightly higher. Females also had higher scores for Enjoyment of School, and Peer Relations (at the 11th grade). Differences in academic achievement scores tended to favor females, but were very minor. Greater differences occurred in the patterns of extracurricular activities engaged in by males and females.

CHAPTER XII

SUMMARY AND RECOMMENDATIONS

This report has presented information concerning the performance of the Utah 5th and 11th grade students tested in the 1975, 1978, and 1981 Utah Statewide Educational Assessments. The performance of Utah students on measures for five of Utah's eight Educational Goals and for Enjoyment of School has been presented. Also examined were results from a set of educational process measures and demographic information. Since summaries have been presented at the end of each results chapter, this chapter will present a review of the overall pattern of change from 1978, followed by key findings and recommendations for educators. Other sections of this chapter will deal with follow-up activities and recommendations for future studies.

Overall Pattern of Change from 1978

The 1981 Statewide Assessment results highlighted areas which were very strong and areas which could benefit from increased emphasis in the public schools. A comparison of Utah's 1978 and 1981 Statewide Educational Assessments showed different profiles of changes for the 5th and 11th grade students.

Exhibits 38 and 39 illustrate the general profiles of results for the 5th and 11th grades, respectively, showing the magnitude and direction of changes in scores from 1978 to 1981. In these exhibits, the 1978 mean score for a measure is always represented as "0", at the

Exhibit 38

Profile of Changes in Scores, 1978-1981, Grade 5

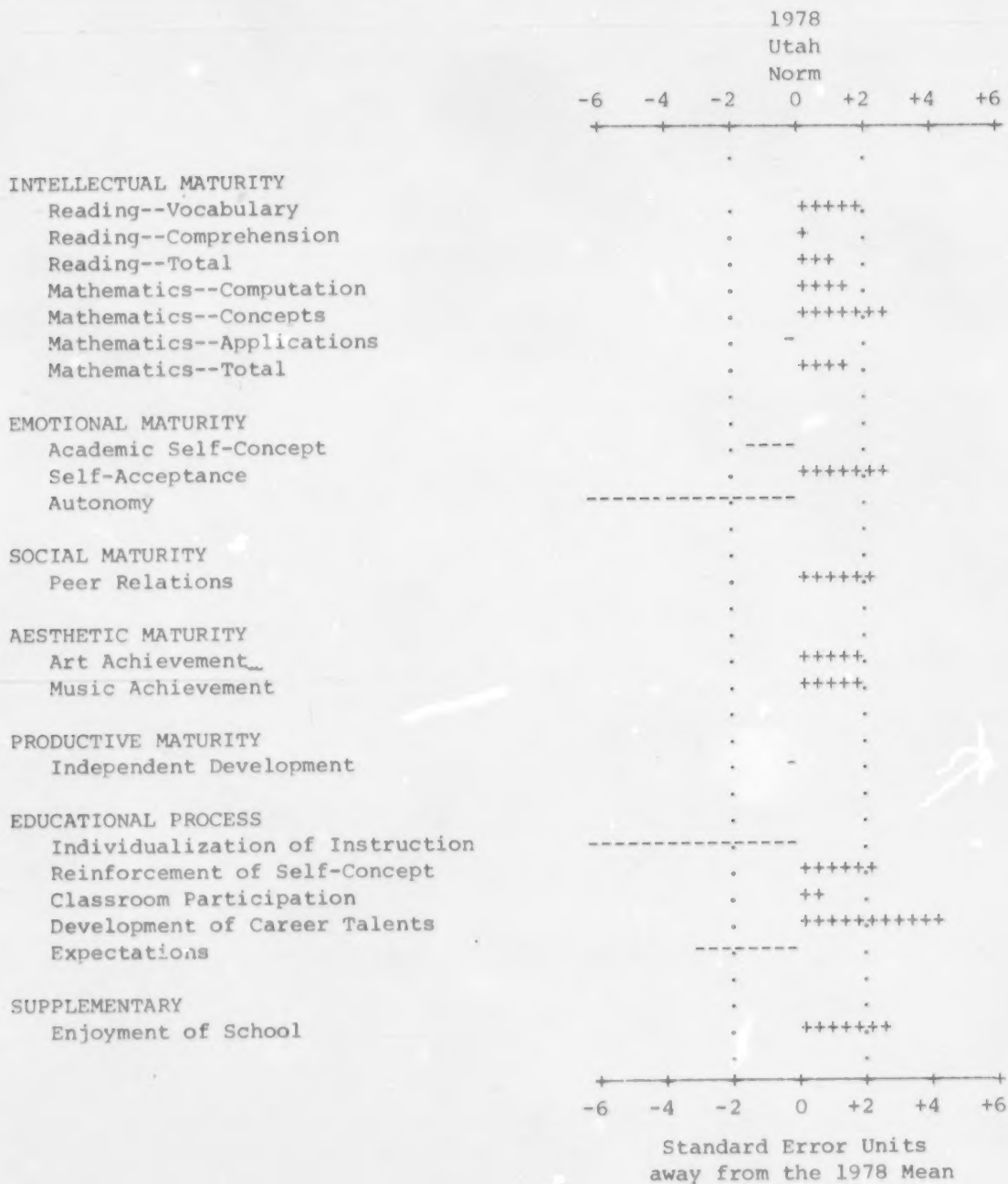
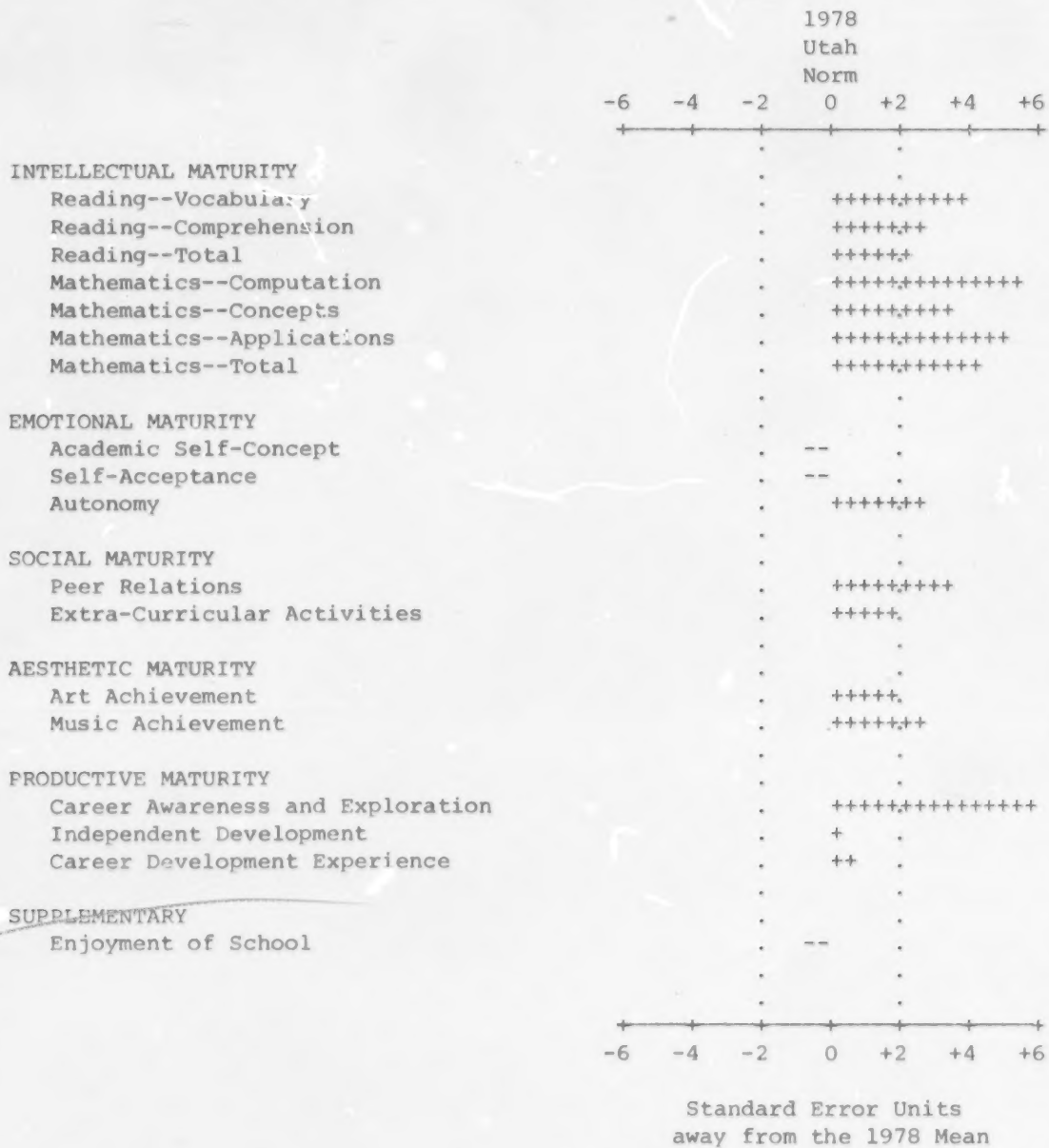


Exhibit 39

Profile of Changes in Scores 1978-1981, Grade 11



center of the charts; a score increase from 1978 to 1981 is shown by a string of plus signs ("+"s) extending to the right of the 0-point, while a decrease from the 1978 results is shown by minus signs ("-")s extending to the left. The magnitude of the change is shown in "standard error" units. This is a statistical scale used to compare the 1978 and 1981 results with the amount of variation expected from chance fluctuation or sampling error. A standard error score greater than "+2" or less than "-2" represents a statistically significant change between 1978 and 1981. So, for example, Exhibit 38 shows that the 5th grade score for Academic Self-Concept decreased by a non-significant amount, while Self-Acceptance increased by a statistically significant amount (beyond what could be expected by chance).

At the 5th grade level, as depicted in Exhibit 38, there were at least slight increases in 14 of the 20 measures which were used in both 1978 and 1981. Increases were most marked in Development of Career Talents, Self-Acceptance, and Mathematics Concepts. Areas of concern, marked by clear decreases, included Individualization of Instruction, Autonomy, and Expectations. Still, increases in 70% of the measures used in five Utah goal areas shows continuing significant progress by Utah elementary schools.

At the 11th grade level, as depicted in Exhibit 39, the results were even more encouraging. Of the 18 measures used in both 1978 and 1981, 15 increased at least slightly, and most of the increases were by significant amounts. The strongest gains were in Career Awareness and Exploration, Mathematics Computation, and Mathematics Application. There were no areas with substantial decreases, although there should be

some concern about small decreases in Enjoyment of School, Academic Self-Concept, and Self-Acceptance.

Key Findings and Recommendations

Intellectual Maturity Goal Area

For both 5th and 11th grades, the performance of Utah students on CTBS tests of mathematics and reading was clearly superior to the national norm groups. Available data suggest that Utah educators are to be commended for the performance of students on these achievement indicators. The 11th grade students, in particular, showed substantial improvements in 1981 compared to 1978.

Special analyses of 11th grade mathematics results showed that students who had taken intermediate or higher-level high school mathematics classes scored substantially higher on mathematics achievement, compared to students who had not taken such classes (although the differences in achievement scores reflect not only differences in mathematics class experience but also pre-existing student differences in interest and ability). A greater percentage of males than females had taken more advanced mathematics courses, and, in small high schools, a smaller percentage of students had taken advanced mathematics courses compared to students in large high schools. The special mathematics item results and recent ACT results suggest that Utah students are not as well prepared in intermediate and higher-level mathematics areas as they are in basic mathematics.

These key findings from the Intellectual Maturity Goal area lead to the following recommendations for Utah educators:

- (1) To deal with the difficulties of Utah students in intermediate and advanced mathematics, a review of the nature and extent of school counseling programs and the Individual Education Plan process should be carried out. Where student abilities and interest warrant, the mathematics background required for different careers should be highlighted. Curriculum offerings and counseling should be coordinated with career plans for individual students to provide adequate mathematics background for student development.
- (2) Review state and district graduation requirements concerning the amount of emphasis placed on basic, intermediate, and higher-level mathematics. The desired level of mathematics expertise and knowledge in the general population needs to be examined. For example, do the current graduation requirements for mathematics meet students' future needs and enable students to fulfill their vocational ambitions?
- (3) Review specific mathematics curriculum content. The evidence suggests that there are opportunities for improvement not only in higher-level mathematics generally but also in a number of specific content categories, especially Mathematical Sentences at the elementary level and Sets and Geometric Relationships at the secondary level.
- (4) Investigate the availability of mathematics courses, especially in the smaller high schools. This investigation should consider whether enough mathematics courses are offered, how additional courses could be offered, and whether the cost of adding more mathematics classes outweighs the benefit to students.
- (5) Study the reasons for the gains in achievement scores at the secondary level. While these gains may be related to the introduction of minimum competency requirements, other possible reasons should be investigated to understand how further gains might be accomplished.
- (6) Examine the status of teacher selection and staff development efforts. This effort may include the collecting of profiles of preparation of mathematics teachers.
- (7) Attention should be devoted to reading skills, despite the consistently high average achievement at both 5th and 11th grades. With continuing emphasis on reading skills for all students, those with difficulties can be helped and the overall level of performance improved.

Emotional Maturity Goal Area

For both 5th and 11th grades, student responses on the Emotional Maturity scales indicated generally positive levels of adjustment, with large numbers of students endorsing positive self-descriptions. However, a small percentage of Utah students reported some difficulties in the Emotional Maturity area (7 to 19% depending on the grade and the score area), indicating that continued sensitivity to the emotional needs of children is very important. For the 5th grade, scores on Autonomy decreased from the 1978 level, returning to the 1975 level. The 11th grade students reported less positive attitudes than the 5th grade students on the Academic Self-Concept scale, but more positive attitudes on the Autonomy scale. In view of the relationship of Academic Self-Concept with a variety of other desirable educational outcomes (such as academic achievement and social ability), this should be a major area of emphasis for the Utah educational system. These key results for the Emotional Maturity Goal area lead to the following recommendations for Utah educators:

- (8) Emphasize instructional strategies, such as Reinforcement of Self-Concept, which are associated with the emotional maturity of students. Develop learning experiences which provide positive recognition of individual student performances. The curriculum should include specific strategies aimed at raising the Academic Self-Concept of all students by developing success experiences and reducing failures (without lowering standards).
- (9) Teachers and counselors should continue to be aware of students with potential emotional maturity problems. Effective educational strategies may produce a wide range of benefits for these students.

Social Maturity Goal Area

Overall, the results indicated an effective level of development in social skills for most Utah students, since a high percentage of students endorsed positive self-descriptions. A small percentage of the sample described themselves as "a little weak" or "poor" on the Peer Relations scale; such students would benefit from greater opportunities and experience in social interaction activities.

The 5th grade 1981 results showed some slight improvement in social maturity compared to 1978. The 11th grade 1981 results showed moderate improvement in Peer Relations compared to 1978 and marked improvement since 1975. No meaningful change occurred in Extracurricular Activities; about 60% of the students continued to report no involvement in the extracurricular activities sampled, with small schools having higher levels of involvement than large schools. These key findings for the Social Maturity Goal area lead to the following recommendations:

- (10) Continue to use appropriate strategies for developing higher levels of social skills. Many strategies, such as increased reinforcement of self-concept and greater use of classroom participation activities, could be merged into other curriculum areas and probably would benefit students with low social skills.
- (11) Review the school-based extracurricular programs to see if additional programs are warranted, especially in the larger high schools. Consider strategies to involve additional students in existing programs.

Aesthetic Maturity Goal Area

The 5th grade results for both Music Achievement and Art Achievement showed that the 1981 students performed at the same level or slightly higher than their 1978 counterparts. The 11th grade results

for both Music and Art Achievement showed that the 1981 students performed at somewhat higher levels than did the 1978 students. On both Music Achievement and Art Achievement, 11th grade students performed at higher levels than 5th grade students, as would be expected. However, levels of Art and Music Achievement can both be improved upon, and ongoing efforts at improvement, which have not yet had time to make a significant statewide impact, should be encouraged. These key findings from the Aesthetic Maturity Goal area lead to the following recommendations for Utah educators:

- (12) Continue to use a variety of strategies, including curriculum guides, pre-service and in-service training, etc., to increase Music and Art Achievement.
- (13) Monitor the implementation of improved music and art curriculum guides and programs, to help determine where difficulties lie and how they may be overcome.
- (14) Evaluate the tradeoffs involved in using different approaches to increase Music and Art Achievement.

Productive Maturity Goal Area

For both 5th and 11th grades, Productive Maturity remains a goal area warranting further attention. The 1981 results for both grades, compared to 1978, showed no real change in Independent Development. The proportion of students who actively participated in self-initiated learning activities was relatively small--barely more than a third.

Despite a surge in Career Awareness and Exploration among 11th grade students, only modest progress has occurred in career education. Although more 11th grade students reported having made some plans and decisions about their future education and careers, having used their school's career resource center, and having received help from the

school in planning courses of study related to tentative career choices, fewer students felt that their school provided sufficient training for employment after graduation. Despite some advances from 1978 to 1981, there is still room for improvement in such career education areas as student use of career resource centers, student participation in work observation as a way of learning about jobs, parental involvement, etc. These key findings from the Productive Maturity Goal area lead to the following recommendations for Utah educators:

- (15) Expand efforts to provide a meaningful Individual Education Plan for all students as described in the present Utah graduation requirements.
- (16) Integrate aspects of career education into other segments of the existing curriculum to increase student familiarity and experience with the world of work. Improved efforts should be made to make education more relevant to career activities.
- (17) Expand programs of career education, with more emphasis on developmental experiences, planning, and decision making with respect to future career choices.
- (18) Provide staff development on career education concepts and appropriate teaching strategies throughout the curriculum to promote higher levels of performance in this goal area.
- (19) Use specific teaching strategies (especially Reinforcement of Self-Concept, Classroom Participation, and Development of Career Talents) which bolster Independent Development.
- (20) Expand programs for students to obtain actual work experience, either as part of the curriculum or through outside work.
- (21) Place more emphasis on learning about comparing costs per unit when making decisions about purchasing products.

Enjoyment of School

On the Enjoyment of School scale, generally positive results were obtained for both 5th and 11th grade students. At both grade levels, a

large percentage of Utah students indicated that they enjoyed school; 11th grade students had somewhat higher scores than did 5th grade students. Although the results were generally positive, there were still about 15 to 25% of Utah students who did not enjoy school--a fact which could have serious implications for the school dropout problem. There are still opportunities for improvement and results obtained with the educational process measures suggest that there are strategies available to increase students' enjoyment. These key findings from the Enjoyment of School scale lead to the following recommendations:

- (22) Continue to accumulate data on educational process measures and other teaching strategies to find means through which the percentage of students who enjoy school can be increased. Measuring Enjoyment of School in educational evaluation endeavors should be a standard procedure. Such attention may contribute to a better understanding of school dropouts.
- (23) Review and implement more broadly the selected instructional strategies that have been found to be significantly associated with higher levels of Enjoyment of School. These strategies include Reinforcement of Self-Concept, Classroom Participation, Development of Career Talents, and Individualization of Instruction.

Educational Process Measures

The student-reported educational process measures had significant relationships with a variety of outcome measures from all the goal areas. One or more of the educational process measures was significantly related to the key performance measure of each goal area. Despite the relationships of the educational process measures with the goal-based measures and the Enjoyment of School scale, the educational processes measured in this study, with the exception of Expectations, were not reported as being frequently used in Utah schools. The results

from the educational process measures lead to the following recommendations for Utah educators:

- (24) Expand the general use of the instructional strategies exemplified by the process measures of the current study to promote higher levels of student performance.
- (25) Use of these (or related) process measures should be considered in most evaluation studies to develop a better understanding of the relationships between educational processes and outcome measures.

Socioeconomic Status

Throughout the report, the significant associations of Socioeconomic Status with achievement and other performance measures have been mentioned. For both 5th and 11th grade students, the SES measure was significantly related to the achievement scores in the Intellectual and Aesthetic Maturity Goal areas and had somewhat lower relationships with key measures from other goal areas. Numerous educational programs at the national and state level, from governmental and non-governmental sources, have been developed to help overcome the problems of the disadvantaged, and the Utah results supported the general importance of such efforts. Continued efforts are necessary to overcome these problems--the results for low SES schools constitute a continuing and difficult challenge for Utah educators.

These results suggest the need for greater emphasis on programs which prepare students to be informed and responsible parents. That is, if the effects of SES on the achievement of students are to be reversed, parents must play an important role. Future parents must have the knowledge and attitudes to overcome the educational disadvantages which now tend to characterize students from lower SES families. Since the

1981 results on Socioeconomic Status are similar to those of 1975 and 1978. the recommendations for Utah educators are similar to those of the previous Assessments:

- (26) Examine all opportunities to aid disadvantaged students in developing their capabilities and, thus, provide for a real equality of educational opportunity.
- (27) Emphasize programs of early childhood education for parents.
- (28) Place greater emphasis on appropriate curriculum to prepare students to become informed and responsible parents.
- (29) Make greater use of specific instructional strategies (Reinforcement of Self-Concept, Classroom Participation, and Expectations) in classrooms in lower SES areas.

Follow-up Issues and Recommendations

As in 1975 and 1978, the development of follow-up activities with appropriate implementation strategies to make full use of the extensive information obtained from the Utah Statewide Assessment program is an important area of concern. Stated alternately, how can the information obtained from the 1981 Assessment be best used?

One of the recommendations of the previous Statewide Assessment reports was to obtain information about how current results could be made more responsive to the needs of users of such information. Since the 1975 and 1978 results have been widely disseminated, this recommendation seems all the more obvious and important today. In the absence of a study about the use of Statewide Assessment results in Utah, the 1981 follow-up recommendations must be similar to those of 1975 and 1978.

At the school and state levels, one of the primary purposes of the Statewide Assessment is to examine the status of education and thereby to promote higher levels of student growth. The information provided to different levels throughout the educational system should not be used in a way that would be counterproductive for professional staff development or student growth. This information should be a positive stimulus to bring about higher levels of performance.

Local Level

At the local level, reports were prepared for each school that participated in the study. These reports were an innovative approach to computer-generated results and consisted of the school's standing on each of the measures used relative to the state average and relative to the average of similar schools (similar on SES, size, location, etc.). With this information, each participating school can examine its own standing in preparing the students on the goal areas assessed in this study and then react to any opportunities for improvement identified. The availability of these data leads to the following recommendations for participating schools:

- (30) Carefully review and analyze the results in conjunction with other information available and take steps to deal with any areas judged in need of attention.
- (31) Provide professional staff with appropriate training in the use of the instructional strategies that were associated with positive results on the key outcome measures.
- (32) Identify specific situational factors which may influence the results of the given school, and consider those situational factors in solving the problems identified at that school.

District Level

Generally speaking, the district personnel, where feasible, should provide support to personnel from the participating schools to attack any areas of concern to the school. Recommendations for the use of Statewide Assessment results relevant to district staff would include the following:

- (33) Consider the use of special teams to attack problems identified at the local school level. These teams might be made up of specialized personnel to provide staff training, demonstrations, and other appropriate services. Where appropriate, districts might use expert State Office of Education support personnel.
- (34) Provide the necessary backup support and a positive environment that will allow administrators and teachers in a school to be innovative in solving the problems facing the students in that school.

State Level

In addition to the recommendations mentioned previously, specific follow-up recommendations at the state level include the following:

- (35) Consider further definition and simplification of the Utah student outcome goals to achieve additional specificity; accumulate information about the measures used for each goal area and their interrelationships to help in operational definitions of the goal areas.
- (36) Emphasize and/or design programs which will implement the instructional strategies identified by this project which had significant relationships with the key outcome measures.
- (37) When appropriate in the evaluation of various categories of educational programs throughout the state, incorporate measuring instruments from the Statewide Assessment. These instruments have been carefully developed, have a statewide norm base, and single copies are available to educators on request.

Recommendations for Future Assessment Efforts

With a large-scale study of this type, there are a number of possibilities for further research which will provide benefits for future assessments. The current study, building upon the extensive efforts of the 1975 and 1978 Assessments, contributed new measurement capabilities that will benefit future assessment studies. These included special items assessing mathematics achievement and mathematics class experience of high school students. Future assessment studies can continue to contribute to this overall measurement capability, so that such efforts can be more thorough, economical, comprehensive, and flexible. Examples of future studies which should be considered include the following:

- (38) Since the pattern has been set for assessments to occur every three years, more comprehensive, systematic, and continuous developmental efforts should take place between the assessment years, i.e., interim measurement studies for development of scales that can be used in the following assessment. This would contribute to more effectiveness and economy of research efforts.
- (39) The measures of educational processes should be expanded to include a measure of school disciplinary climate. Research (reviewed in Chapter II) indicates that disciplinary climate is related to student outcomes, and Gallup polls indicate that people most frequently cite discipline as one of the major problems facing the public schools.
- (40) As opportunities permit, results of Utah Statewide Assessment efforts and measurement technology should be used in a variety of state and district level evaluation studies. The availability of extensive norm data would make such evaluation studies more economical and would also benefit future assessment studies by providing additional information about educational program effects. Some projects are already using such options to obtain economical measurement coverage.

- (41) Economic constraints have not permitted use of some sophisticated analytic techniques that would contribute to a better understanding of progress toward Utah's educational goals. The research and program analysis opportunities inherent in the Utah Statewide Assessment program, both longitudinal and concurrent, should be more actively pursued in the future.

The third Utah Statewide Educational Assessment has provided extensive information to educators, the public, and the legislature about the performance of Utah's schools. In essence, the study has fulfilled important aspects of the accountability requirements which any public program warrants. In addition, the substantial range of information should help fill an even more important goal--improving education for Utah students. This is what the Statewide Assessment program is about, and future assessments will work toward providing information which facilitates achieving higher levels of performance.

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APPENDIX A

1981 SAMPLE SIZES, MEANS, MEDIANS, AND STANDARD DEVIATIONS

FOR 5TH AND 11TH GRADE INDIVIDUALS

APPENDIX A

1981 SAMPLE SIZES, MEANS, MEDIANS, AND STANDARD DEVIATIONS

5th Grade Individuals

<u>Variable</u>	<u>N</u>	<u>Mean</u>	<u>Median</u>	<u>S.D.</u>
1. Academic Self-Concept	4074	100.75	100.8	5.47
2. Self-Acceptance	4073	101.79	102.4	4.12
3. Autonomy	4075	101.14	101.1	3.66
4. Peer Relations	4075	100.10	99.9	7.95
5. Art Achievement	4113	110.86	110.8	3.91
6. Music Achievement	4117	109.50	109.0	4.86
7. Independent Development	4075	97.73	97.3	8.33
8. Individualization of Instruction	3752	97.97	97.8	4.34
9. Reinforcement of Self-Concept	3752	101.76	102.4	5.13
10. Classroom Participation	3752	101.20	101.4	5.05
11. Development of Career Talents	3752	98.69	98.5	4.41
12. Expectations	3752	105.62	106.1	4.01
13. Enjoyment of School	4075	99.37	99.2	5.06
14. Mathematics Background	4075	101.50	101.8	2.78
15. Reading Background	4075	100.46	100.6	3.65
16. SES--Financial	3752	104.21	104.5	3.17
17. SES--Educational	3747	101.10	101.2	2.22
18. SES--Total	3752	105.30	105.5	4.47
19. Reading--Vocabulary	4455	28.73	30.1	7.42
20. Reading--Comprehension	4450	29.89	31.8	9.19
21. Reading--Total	4446	58.64	61.9	15.69
22. Mathematics--Computation	4398	33.59	35.8	9.29
23. Mathematics--Concepts	4393	16.34	16.9	4.76
24. Mathematics--Applications	4354	15.54	16.1	5.95
25. Mathematics--Total	4345	65.70	68.2	17.88

APPENDIX A, CONTINUED

1981 SAMPLE SIZES, MEANS, MEDIAN, AND STANDARD DEVIATIONS

11th Grade Individuals

<u>Variable</u>	<u>N</u>	<u>Selec- ted N</u>	<u>Mean</u>	<u>Median</u>	<u>S.D.</u>
1. Academic Self-Concept	2208	769	99.16	98.4	5.79
2. Self-Acceptance	2207	769	101.26	101.3	4.23
3. Autonomy	2208	769	102.65	102.9	3.68
4. Peer Relations	2207	769	102.01	102.3	8.54
5. Extracurricular Activities	2194	766	98.19	97.6	4.39
6. Art Achievement	2251	786	114.95	115.3	4.05
7. Music Achievement	2248	785	113.92	114.2	5.72
8. Career Awareness and Exploration	2194	766	108.33	109.3	6.98
9. Independent Development	2208	769	97.91	97.7	7.81
10. Career Development Experiences	2192	764	98.93	98.9	4.80
11. Productive Maturity-- Cognitive	2194	766	114.25	114.6	2.73
12. Enjoyment of School	2208	769	99.78	99.7	5.22
13. Mathematics--Cognitive	2273	790	120.45	120.9	6.95
14. Mathematics--Class Experience	2193	765	99.10	99.2	3.17
15. Mathematics Background	2208	769	99.91	99.3	2.97
16. Reading Background	2208	769	99.68	99.2	4.31
17. SES--Financial	2194	766	104.76	104.9	2.78
18. SES--Educational	2194	766	101.86	102.1	1.79
19. SES--Total	2194	766	106.62	106.9	3.86
20. Reading--Vocabulary	2177	748	29.47	31.0	7.77
21. Reading--Comprehension	2176	748	32.08	33.0	7.86
22. Reading--Total	2172	746	61.56	63.9	14.79
23. Mathematics--Computation	2141	735	35.65	38.1	10.10
24. Mathematics--Concepts	2108	724	17.82	19.0	4.97
25. Mathematics-- Applications	2100	720	16.55	17.9	5.87
26. Mathematics--Total	2099	719	70.38	73.2	19.10